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FROM

THE RECORDS

OF

THE GOVERNMENT OF INDIA,  
(FOREIGN DEPARTMENT.)

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R E P O R T

ON

The Pegu Teak Forests,

FOR THE YEARS

1857-58 TO 1859-60,

WITH APPENDIX.



# TABLE OF CONTENTS.

	<i>Page</i>
Memorandum: Progress Report of the Pegu Forests for 1857-1858, ..	1
Report on the Pegu Forests for 1858-1859, ... ..	6
Present extent of the Pegu Section of the Forests in British Burmah,	<i>ib.</i>
Provision made for the supply of Teak in future years, ... ..	<i>ib.</i>
Size of the Trees selected for girdling, ... ..	7
Number of logs brought down from the Pegu Forests, since the occu- pation of the Province, ... ..	<i>ib.</i>
Disadvantages of the plan of bringing the greater portion of the tim- ber direct to Rangoon, and measures taken to obviate them, ...	8
Number of logs delivered from the Forests at Rangoon and other places,	<i>ib.</i>
Result of the Timber sales, ... ..	10
Improvements to be introduced in the working of the forests, ...	11
Measures taken for the protection and improvement of the Forests, ...	12
Training of the local Forest subordinates, ... ..	14
Statement of Timber received and disposed of from Pegu Forests on account of the Forest Department, from 1st May, 1856 to 30th April, 1859, ... ..	16
Statement of amount realized for Loozars and Doogies at the different Public sales at Rangoon in 1856-57, 1857-58 and 1858-59, ...	17
General Statement of Expenses incurred and Revenue realized during the years 1856-57, 1857-58 and 1858-59, ... ..	18
Statement of Forest work done in 1856-57, 1857-58, and 1858-59, ...	19
Progress Report on the Pegu Forests for 1859-60, ... ..	20
Introductory Remarks, ... ..	<i>ib.</i>
Extent to which the Forest Survey of the Pegu Forests has been conducted, ... ..	<i>ib.</i>
Tharawaddie Forests, ... ..	21
Lower Tharawaddie Forests, ... ..	22
Middle Tharawaddie Forests, ... ..	<i>ib.</i>

	<i>Page</i>
Upper Tharawaddie Forests, ... ..	23
Obstructions in the Streams of the Tharawaddie District, ...	23
Other Trees of the Tharawaddie Forests, .. ...	24
Proportion of Teak Trees of different classes in the Tharawaddie Forests, ... ..	25
Probable annual outturn from the Tharawaddie Forests, ...	<i>ib.</i>
Future prospects of the Tharawaddie Forest Seedlings, ...	26
Enemies of Teak-Creepers and Epiphytic ficus, ... ..	<i>ib.</i>
Examination of the Tharawaddie Forests, ... ..	<i>ib.</i>
Inhabitants, ... ..	27
Necessity for introducing Foresters from abroad, ... ..	<i>ib.</i>
Yield of Timber from the Tharawaddie Forests, ... ..	28
Eastern Prome Forests, ... ..	29
Prome Hill Forests, ... ..	30
Shwoelay Forests, ... ..	30
Former working of the Shwoelay Forests, ... ..	<i>ib.</i>
Number of large Teak trees in the Shwoelay and Shaboung Forests, ...	31
Area of Teak-producing Tracts, ... ..	<i>ib.</i>
The inhabitants of Prome Forests, ... ..	<i>ib.</i>
Western Forests, ... ..	32
Division of Western Forests, ... ..	<i>ib.</i>
Survey of Western Forests (General results), ... ..	33
Matoong and Mudday Forests, ... ..	<i>ib.</i>
Mudday Forests, ... ..	35
Shwoetinga Forests, ... ..	36
Padashin Forests, ... ..	38
Mamya Forests, ... ..	39
Opho Forests, ... ..	<i>ib.</i>
Forests in the Bassein District, ... ..	40
Yield of Western Forests, ... ..	<i>ib.</i>
Southern Forests, ... ..	41
Zamayee, or Pegu Forests, ... ..	42
Powiglin Forests, ... ..	43
Hline Forests, ... ..	44
Southern Forests, Area and Teak on the same, ... ..	46
Western Sitang Forests, ... ..	<i>ib.</i>
Western Sitang Forests near the Frontier, ... ..	48
Klaboung Forests, ... ..	<i>ib.</i>
Hpyoo and Koon Forests, ... ..	<i>ib.</i>
Bonee Forests, ... ..	<i>ib.</i>

	<i>Page</i>
Estimated area and yield of Western Forests, ...	48
Inhabitants, ...	49
Eastern Sitang Forests, ...	<i>ib.</i>
Forests below the Padah Choung, ...	50
Padah and Moong Forests, ...	<i>ib.</i>
Youkthawah and Thoukyaghat Forests, ...	53
Teak localities drained by the feeders of the Thoukyaghat stream, ...	54
Thoukyaghat Forests in the plains and lower Hills, ...	56
Kanee and Koonoong Forests, ...	58
General review of the six divisions of the Pegu Forests, ..	59
Amount of Timber brought down from the Forests, ...	60
Seasoned timber getting scarce in the Forests, ...	<i>ib.</i>
Amount of old seasoned timber still remaining, ...	61
Great demand for Elephants, ...	62
The yield of Timber more satisfactory in the Forests near Rangoon, ...	<i>ib.</i>
Increase in the size of the timber, ...	64
Expenses incurred on account of the timber, ...	<i>ib.</i>
Number of logs sold during the year, ...	65
Revenue realized, ...	67
Amount of assets at the end of the year, ...	68
General financial results unsatisfactory, ...	<i>ib.</i>
Estimates compared with results actually attained, ...	69
Change of plan in the working of the Forests necessary, ...	70
Issue of Permits, ...	<i>ib.</i>
Working of the Forests by means of Government Elephants, ...	72
Elephants available from the Commissariat Department not sufficient, ...	74
Other improvements contemplated by this mode of working, ...	<i>ib.</i>
Location of the Head Quarters of the Forest Department in the Tharawaddie Forests, ...	76
Advantages of the situation of Myoduin, ...	77
The location of the Head Quarters of the Forest Department not merely a measure of a temporary nature, ...	78
Clearing of obstructions in the streams required for floating timber, ...	<i>ib.</i>
Provisions for the supply of seasoned timber in future years, ...	79
Review of the girdling operations hitherto made, ...	80
The operation of marking all first-class trees dispensed with, ...	81
Numerous trees not likely to yield good timber girdled in 1854, ...	<i>ib.</i>
Districts in which the girdling was carried on in 1857, too extensive, their size limited in 1858, ...	82
Improvements introduced in the girdling operations in 1859, ...	83

	<i>Page</i>
Proportion of trees to be removed, to be determined in every instance by a Forest Survey, ... ..	83
A share to be allowed to contractors and permit holders in the operation of girdling, ... ..	84
Mode of controlling the work done, ... ..	85
Measures taken for the protection and improvement of the Teak in the Forests, ... ..	86
Timber given gratuitously for building for the common benefit of the public, ... ..	87
Management of drift timber, ... ..	88
Work for the improvement of the Forests, &c. ... ..	<i>ib.</i>
Prome Teak Plantation, ... ..	89
Experimental cultivation of Cotton, ... ..	<i>ib.</i>
Assistants and Subordinates, ... ..	90

#### STATEMENTS.

Extract from Forest day-books of Pegu section, showing number of Teak trees, counted from 1857 to 1860, ... ..	93
Exhibiting number of Teak trees of different classes estimated to stand on one square mile in the Teak-producing localities of the Pegu Forests, ... ..	95
Exhibiting quantity of timber brought down from the Pegu forests, from 1856-57 to 1859-60, ... ..	96
Exhibiting receipts and disposal of Teak timber from the Pegu forests, from 1st May, 1859, to 30th April, 1860, ... ..	98
Exhibiting expenditure on account of Timber of different classes received during 1859-60, ... ..	99
Exhibiting amount realized by sales of timber during 1859-60, ... ..	100
Exhibiting amount realized for Loozars and Doogies at the public sales at Rangoon from 1856-57 to 1859-60, ... ..	101
Exhibiting disbursements of the Superintendent of Forests in Pegu during 1859-60, ... ..	102
Exhibiting amount of Timber revenue realized during 1859-60, ... ..	104
Exhibiting the different estimates of revenue realized and Timber brought down from the Pegu Forests, ... ..	105
Exhibiting number of Permits issued for working a portion of the Pegu Forests during 1860, ... ..	106
Exhibiting quantity of timber granted for the erection of religious buildings, &c., from 1857 to 1859, ... ..	107

	<i>Page</i>
Exhibiting amount of Forest work done in the Pegu section of the Forests from 1856-57 to 1859-60, ... ..	108

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## APPENDIX.

Extract from Journal of a Tour by Mr. A. S. MacDonald into the Sitang Forests, ... ..	111
Extract from Circular No. 4, dated Rangoon, 2nd November, 1858, regarding girdling of Teak trees, ... ..	118
Form of Permit issued for working the Forests in the Pegu section— limits of the Forest—and articles of Permit, ... ..	119
Pegu Forest Rules, dated Rangoon, 1st October, 1859, ... ..	121

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SCHEDULE I.—Exhibiting the Rules under which Government timber in the Province of Pegu may be disposed of, ... ..	126
--	-----

SCHEDULE II.—Exhibiting the rates for the collection of Revenue on foreign Teak timber, when brought within the British territory on the Northern Frontier, ... ..	129
--	-----

SCHEDULE III.—Form of pass for foreign timber imported into the British Territory, ... ..	130
--	-----

SCHEDULE IV.—Form of certificate to be given by the Frontier Goung above Toungoo, ... ..	131
---	-----

SCHEDULE V.—Form of pass for timber sold by the Forest Depart- ment at Stations above Rangoon, ... ..	132
--	-----

SCHEDULE VI.—Names of River Stations at Rangoon, where all private timber will have to stop to be examined, ... ..	133
---	-----

SCHEDULE VII.—Exhibiting the rates which will be charged at the different Government Timber stations for salvage, &c. &c., ... ..	<i>ib.</i>
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Letter to Major A. P. Phayre, Commissioner of Pegu, and agent to the Governor-General, Rangoon, on the removal of obstructions in the water courses, &c., ... ..	134
Description of the Wasoe Kadin, ... ..	137
Description of the Kyoukloongyi in the Thoungzay Choung, ... ..	138
Statement of measurement of rocks to be removed in the Thoungzay Kyoukloongyi, ... ..	140
Statement showing the increase of establishment proposed for the office of the Superintendent of Forests in Pegu, ... ..	141



	<i>Page</i>
Correspondence with Colonel A. P. Phayre, Commissioner of Pegu and Agent to the Governor-General, on the introduction of the Permit system into the Sitang and Prome forests, with Annexures, ...	144
Letter to Colonel A. P. Phayre, Commissioner of Pegu and agent to the Governor-General, Rangoon, on the granting of Forest Permits to others than Thitgouns, ... .. '...	169



# REPORT

## ON THE

### PEGU TEAK FORESTS.

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#### MEMORANDUM: PROGRESS REPORT OF THE PEGU FORESTS FOR 1857—1858.

THE Teak producing tracts of the country have been divided into six main divisions, in which the killing and felling of trees is carried on in a turnus of twenty-four years, one-fourth of the available I. class trees being killed annually in one of the six divisions.

At the end of this turnus of twenty-four years, the trees of the II. class will have taken the place of the I. class.

2. The operation of selecting the trees to be killed and of girdling them, forms the principal portion of the forest work for every dry season, and has hitherto been done under the personal supervision of the Superintendent.

The under-mentioned timber has been girdled :

In the dry season of 1857, in the 1st division (Tharrawaddie forest), 50,018 trees above 6' in girth.

Ditto, 2nd division (Eastern Promo forests), 35,859 ditto.

Ditto, 1858, 4th division (Southern forests), 44,272 ditto, 7' in girth.

3. All six divisions are not equally rich in Teak; but 7,20,000 trees may be considered as the minimum amount of I. class trees, i. e. of 6' girth and above, that are easily enough accessible to be removed, and that will have to be girdled up to the year 1880, affording an average annual supply of 30,000 logs, if sufficient means for working the forests, that is, if a sufficient number of elephants can be obtained.

4. The operation of selecting the trees to be girdled has in 1858 been improved, in so far, that only the largest trees are now taken, which accounts for the larger girth of the trees girdled in 1858.

5. The operation of bringing down the timber through forest contractors, under the supervision of the officers of the Department, has answered beyond expectation, as far as the number of logs brought down, is concerned.

The number of logs brought down to the different receiving stations, was in

1856-57 .....	22,738 logs.
1857-58 .....	18,117 logs.

The larger amount of the first year is explained by the circumstance, that there were many logs ready cut in the forests, and partly dragged to the waterway.

At the same time the timber of 1857-58 has been larger than that of 1856-57.

All this timber is old, seasoned timber, either Nathat or girdled before the British occupation. Its value does not consist in its size, nor is it generally very straight; but it is thoroughly seasoned, many of the trees having been dead for more than twenty years.

6. The forest contractors were in the first year a very mixed set. No other parties coming forward, subordinates of the Department had, in many instances, to be charged with the work.

This mode, however, was abandoned as soon as practicable, and numerous foresters (Thit Goungs) Karens, Burmans, and Taleins, have come over from Maulmein and the Karenee country, with their elephants. These men generally drag the large logs only by their elephants, leaving the small timber to the inhabitants of the district, who employ their buffaloes under an arrangement with the main contractors. The percentage allowed to the latter in these cases is generally five per cent, and does not exceed ten. For the rafting and floating of the logs to the place of delivery, inhabitants of the district are employed almost exclusively.

But besides the foreign forest contractors, a number of the inhabitants of the district, both Burmans and Karens, have come forward, purchased or hired elephants, and taken contracts. Every thing is done in order to encourage such parties where practicable.

Myookes and Thugees of districts, as a general rule, do not engage in such contracts, but their sons and nephews frequently do. ' It is to be expected that before long many of the villages in the interior of Pegu will possess their elephants, as is the case in the Attaran, Thoungyeen, and other districts of the Tenasserim Provinces. It may then be possible in certain tracts to dispense altogether with the system of contracts and advances, and to let each village bring down the timber from its adjoining forest tracts. The immediate adoption of this mode has been suggested for the Tharrawaddie district, but would, in the present state of things, lead to no result.

7. The system of giving advances to forest contractors has not yet been done away with. To contractors who do not take advances until shortly before their timber is delivered, a small addition to the rates for their timber is granted.

But money is so dear at Rangoon that at present the amount of timber brought down by a contractor is almost proportionate to the amount of advances given to him.

The principal improvement in the working of the forests is the concentration of our operations at Rangoon.

In 1856-57 only 3,242 logs were delivered at Rangoon.

„ 19,496 logs at other stations.

In 1857-58, „ 4,097 logs at Rangoon.

„ 14,020 logs at other stations.

This required the employment of other parties for the floating of the timber to Rangoon, thus causing the loss of timber and complicating the accounts.

In 1858-59 only a portion of the Prome timber will be delivered at that station. All the timber from Toungoo and other forests will go direct to Rangoon, with exception of such logs as may here and there be required for local consumption.

8. The sales of timber have not been so satisfactory as was anticipated. The proportion of small pieces (the inheritance of the wasteful mode of working in the Burmese times) was too large for local consumption, the number of purchasers for export or ship building was limited, and the prices consequently low. This has been the cause of the decrease in the revenue of the Forest Department.

The number of logs sold in 1856-57 was 8,297; amount realized Rs. 75,264-0-9.

The number of logs sold in 1857-58 was 16,261; amount realized Rs. 1,12,054-10-2.

The large number of timber on hand (unsold) consists of Toungoo timber, which requires one and sometimes two years to be floated through the creeks to Rangoon, and of timber from the other districts, which was kept back by the Superintendent on account of the low state of the market.

Rangoon does not yet, it would appear, offer those facilities to exporters of timber or ship-builders which Maulmein presents. The number of timber yards in working order is small. Rangoon sawyers are even more unsteady than those of Maulmein, and it is thus difficult in a short time to convert large quantities of round timber into the shapes required for shipping.

An attempt has been made to meet some of these difficulties by permitting the sawing up of timber on the grounds of the Government timber depôt, under certain conditions and against payment of rent.

9. The measures for the protection of the Teak in the forests are progressing satisfactorily.

The forest rules are known and, in general, observed throughout the country.

Teak trees and Teak timber are no longer the objects of wanton destruction; and the consequence is the springing up every where of young Teak in *much larger numbers than the inhabitants remember having ever seen before.*

Toungyas are now, as a rule, formed on spots without Teak, and the complaints which were loud in the first year after publication of the rules, have subsided. No villagers have left the country on account of the rules. No person has been punished by the Superintendent on account of injury done to Teak by Toungyas or otherwise.

10. The operations for the improvement of the growth of Teak have principally consisted in—

1st. Cutting away of creepers. This operation ensures a straight growth to the tree, and has been carried on, on a large scale in those districts where the operation of girdling has been performed. Every Teak tree, large or small, within sight of the workmen employed in girdling, has been freed of creepers. Besides this process of clear-

ing on a large scale, each of the local Goungways is employed in carrying on this work in his district.

2nd. Protecting Teak timber in the forests, and young Teak trees, from fire by clearing a sufficient space round them from dry weeds and brushwoods.

3rd. Girdling of such other trees as interfere with the growth of young Teak.

11. Plantations on a small scale (not exceeding one acre in size) have been established in the forests themselves by the local Goungways. It has been made their duty to establish annually one plantation of this kind.

It has not yet been possible to induce villagers to sow Teak in their Toungyas, and thus to rear Teak forests instead of the impenetrable wilderness. This, if the people can ever be brought to do it, is likely to become the most efficient mode of planting Teak in this country.

The experimental plantation at Prome on the banks of the Irrawaddie was established in May 1857. Its size is limited, the ground which it is intended to cover with Teak, being only 73 acres. It cannot be desirable, artificially to raise large forests in a country where the price of labor is so high.

The principal object of this plantation is to afford an opportunity of studying throughout the year the growth of Teak in localities of easy access, and yet not distant from the original habitat of the tree.

The Teak which was sown in one part of the plantation with a view not to be transplanted has sprung up well, but has suffered from fire during the dry season of 1858.

The nursery on which the seedlings were raised for transplantation has succeeded well. About 40,000 seedlings were raised, which are being transplanted during the rainy season of 1858.

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu and Tenasserim.*

RANGOON,

The 10th September, 1858. }

## REPORT ON THE PEGU FORESTS FOR 1858—1859,

DATED RANGOON, 7TH JULY, 1859.

SINCE the whole of the forests of the Pegu, Tenasserim and Martaban Provinces were united under

Present extent of the Pegu Section of the Forests in British Burmah.

one charge, it has become necessary, in order to facilitate the administra-

tion of these very extensive tracts, to incorporate with the Pegu section those forests of the Martaban Province, that are situated in the valley of the Sittang river and its feeders.

For in the dividing of the forests natural boundaries must of necessity be observed. Forests situated in the same valley and whose timber has the same outlet must be worked according to the same principles, and the subordinates employed in the same must be trained to the same routine of business. Thus the forests of the Pegu section at present consist of the whole of the Sittang, Irrawaddy and Southern Forests.

A certain portion of the receipts and disbursements of the Pegu section, proportionate to the quantity of timber brought down from the Martaban forests during the year, will annually be credited and debited to the revenue of the Martaban Province, but the progress of the technical operations of the Department must be recorded in the report on the Pegu Forests, whether the operations have been conducted in the Martaban section of those forests or not.

This extension of the forests belonging to the Pegu section has rendered necessary a slight change in the established divisions. The 5th division comprehends now the whole of the forests on the west side of the Sittang valley, and the 6th those on the east.

2. The operation of selecting the trees to be killed, and of girdling them, has this year been

Provision made for the supply of Teak in future years.

conducted in the 6th division. It was commenced under the supervision of

the Superintendent himself, and afterwards, during his tour through the Martaban and Tenasserim forests, continued by the Assistant for the Sittang forests, he having been longest in the Department, and being best acquainted with the technical part of the work.

All assistants and as many subordinates as could be spared from other parts of the province, had been assembled in the forests of the 6th division, and were employed in the work: thus an opportunity

was afforded them of becoming acquainted with the mode of carrying on the operations.

The result has been less successful than in former years, only

\* Vide letter from Commissioner Pegu, dated 9th September, 1859, No. 157.

about\* 13,000 trees having been girdled, making a total of 1,41,000 trees girdled within the three last

years. This is attributable to the following reasons :

1st. On account of the extraordinary unhealthiness of the season. The greater portion of the native subordinates was disabled by fever and dysentery before two months had elapsed, and the Assistant in charge of the work was himself suffering from repeated and severe attacks of the same complaints during nearly the whole time of his stay in the forests.

2nd. The want of funds in the Toungoo Treasury, which rendered it necessary repeatedly to send away the coolies after they had commenced work in a new locality.

3rd. The comparative scarcity of Teak in the forests of the 6th division, which can hardly be said to contain more than half the number of trees in one of the other divisions.

3. The standard size of the trees girdled has again been raised.

Size of the trees selected for girdling.

Only trees above 8' 3" in girth have this year been killed, the girth being measured as always at 6' from the

ground. This is an improvement of importance, as it will considerably enhance the value of the timber brought down, care being taken to kill such trees only as are perfectly sound.

\*4. The number of logs brought in from the forests this year

\* No. of logs brought down from the Pegu forests since the occupation of the Province.

has been less than in either of the two foregoing years (see statement on the margin).

	Years.	No. of Logs.	Total.
No. of Logs brought down by private parties before the close of the forests and passed for duty	1854-55	20,724	
	1855-56	22,895	
	1856-57	3,499	
No. of Logs brought down on Government account in	1856-57	22,738	47,118
Ditto ditto in	1857-58	18,117	
Ditto ditto in	1858-59	14,794	
			55,649

This was not unexpected. The timber left in and near the forests at the time of the British occupation, and out of which, before the working of the forests on Government account commenced, 47,118 logs had already been removed,

Total No. of Logs removed from the Pegu forests since 1st May, 1854 ..... 102,767, or 61,059 Tons.



is gradually becoming scarce. At first such timber only was removed as could be brought without much difficulty ; but every log brought away now has to be dragged for considerable distances, often many miles, before a water-way is reached ; yet as the number of logs decreases, their size and value increase.

Only a few hundreds of the 4,500 trees girdled by Dr. McClelland's orders in the Southern Forests are included in the 55,649 logs shown above : the remainder were all girdled in the Burmese time. It could scarcely be expected that the quantity of old seasoned timber available from the Pegu Forests would be so considerable.

The new girdled timber of the 1st division (Tharawaddce Forests, girdled in dry season 1857,) will (with the exception of a few from the Minhla Forest) not be brought down and sold till the autumn of 1860. The year 1859-60 therefore cannot be expected to yield a very large revenue. This sacrifice of an immediate return has been made in order to ensure the bringing down of only perfectly seasoned timber on Government account.

No tree will be felled unless it has been standing killed for three full years, and a large portion will be allowed to stand four years or even longer.

5. The endeavour to concentrate as much as possible the work of receiving, collecting, classifying and selling the timber at Rangoon has progressed favorably. Nearly two-thirds of the total amount were delivered at Rangoon during 1858-59, as appears from the statement on margin.

Only small quantities are at present kept back at Prome, Toungoo and other stations in the interior, so as to meet the demand for local consumption.

The advantages of this plan are, simplification of the accounts, and obviation of the loss of timber for which payment has already been made. The principal disadvantage consists in the propensity of most Burmans and many Karens who engage in business, to swindling.

No. of Logs delivered from the forests at

	Rangoon.	Other places.	Total.
1856-57,	3,242	19,496	22,738
1857-58,	4,097	14,020	18,117
1858 59,	9,724	5,070	14,794
Total .....	17,063	38,586	55,649

It frequently happens that, long after all accounts are settled with a forest contractor for the timber he has brought down, his workmen appear, and declare that they have not received any payment for the cutting, dragging and floating of this timber.

Such fraudulent proceedings might be effectually avoided by abandoning the system of contracts altogether, that is, by taking charge of the logs from the parties who have cut them, and paying them on the spot for the work done, then paying separately for the dragging, and in the same manner for the floating of the logs.

But this is impracticable; for payments would have to be made, and timber taken charge of, in all parts of the province simultaneously.

In order to check these swindling propensities of forest contractors, a rule has been inserted in the new general forest rules, rendering such parties as attempt to defraud their workmen of their due wages liable to punishment.

It is, however, to be hoped that this practice will gradually be rooted out by means of a strict observance of a principle which has repeatedly been represented as an unjust one. After the term of a forest contract has expired, all timber not actually delivered, is considered as reverting to the Forest Department, whether it may have been left in the forests or abandoned on its way down, and the contractor is not entitled to any compensation for the labour or money expended in bringing the timber to the place where it was left.

And so intricate is the nature of the work, that owing to the sudden fall of the water or to other unforeseen circumstances, a certain amount of timber is annually left in the forests, or on the way between them and the place of delivery.

The contractor is thus obliged either to give up a considerable amount of work already done, with the expenses incurred, or to apply for a new contract for the next year, which is of course never granted to a man who has been found to swindle at the expense of his workmen.

## 6. The comparative results of the timber sales of the last

Result of the Timber sales.

Year.	No. of Logs sold.	No. of Tons.	Amount realized.	Average amount per Log.	Average size of the logs in cubic feet.	Average amount realized per ton.
1856-57,	8,297	5,893	75,261 0 9	9 1 0	35	12 0 0
1857-58,	16,261	7,845	1,12,051 10 2	6 14 0	*21	14 0 0
1858-59,	20,561	14,617	3,75,923 6 2	18 4 0	35	26 0 0
Total,	45,119	28,355	5,63,212 1 1	12 7 0	31	17 0 0

\* Only the smaller sizes of timber were sold this year, the larger ones were left.

three years are as follows, (see margin). The statement shows the great influence of the price of timber on the Revenue of the Department. For although neither size nor quality of the logs was the same for the three years in question, the difference was by no means proportionate to the great variations in the average amount realized.

The cause of these uncontrollable fluctuations of the timber revenue is also shown in Statement No. 2, which exhibits the amount realized

\* (Length from 30'—35' middle for 2 classes of logs. Doogies\* and girth from 5'—8'. Loozars (18'—25' long; middle girth from 5'—8').

It is of interest to compare the average rates realized, with the average amount expended per log for the timber brought in during

Years.	Timber Expenses.	No. of logs brought down.	Average expenses per Log.
1856-57,	1,14,746 8 8	22,738	5 0 0
1857-58,	1,28,998 3 4	18,117	7 1 0
1858-59,	1,26,189 14 6	14,701	8 8 0
Miscellaneous Expenditure,	3,69,934 10 6	55,649	6 10 0
Total,	2,40,546 0 9	55,649	4 5 0
	6,10,480 11 8	55,649	10 15 0

the last three years. The statement annexed only exhibits the timber expenses or the amounts paid for cutting, dragging, floating, watching, dragging up, and selling the logs: in other words, only those expenses which are connected with the present plan of working the forests on Government account.

The profit on the sales, after deducting the expenses incurred, has been, for the three years in question, Rs. 12-7, Rs. 6-10 and Rs. 5-13

per log. But the greater part of this is absorbed by the Miscellaneous Expenditure, amounting for the whole period to 39·39 per

Timber Expenses, ...Rs.	6	10	0
Miscellaneous do. ....	4	5	0
Profit do. ....	1	8	0
	<hr/>		
Rs.	12	7	0

cent. of the total expenditure incurred. This then takes away another  $\frac{4}{5}$ , leaving as clear profit only one rupee and eight annas per log. To

this, however, must be added the whole of the miscellaneous revenue, amounting within the three years to Rs. 34,300-10-6.

This result of the operations of the Department is so insignificant, that if there were no certain prospect of improvement in future years, the question might well be considered, whether the advantages gained by the preservation and increase of the Teak in the forests, appear important enough to justify the continuation of the Forest Department in Burmah.

But it must not be forgotten that the first years of this undertaking are necessarily the least favorable as regards results, because we are limited to a constantly decreasing supply of timber of small size and inferior quality, and that when the new seasoned timber is brought to market, there will be found a considerable increase both in the number and size of the logs. At the same time the new girdled logs will, in most cases, be more easily accessible, and hence the rates that will have to be paid for their removal are not likely to be increased.

We are therefore not justified from the results of the first three years in drawing a conclusion as to what may be reasonably expected as the result of this new stage in our operations, the first effects of which will only be seen in 1860-61.

7. But there are numerous modes by which the revenue can

Improvements to be introduced in the working of the forests.

be gradually increased, and the usefulness of the Department augmented.

Not to mention works of a larger extent: as the removal of obstructions in the streams that form the channels for floating the timber from the forests (sufficiently discussed in former reports,) a few improvements on a smaller scale, but yet of great importance, may here be mentioned.

If the present system of working the forests on Government account is persevered in, the squaring of the logs in the forests and the cutting of planks, so as to facilitate the removal of timber from places difficult of access, will gradually be introduced; first as an experiment entrusted only to such forest contractors as have been in con-

nection with the Department for a number of years and have shown themselves active and worthy of trust.

The use of sling carts on even ground, and of iron drags on the hills to diminish the friction and avoid the stoppage of logs by small impediments, further the use of the saw in felling trees, must be introduced, as soon as practicable.

A systematic mode of cutting crooks will also have to be adopted, as a supply of good circular timber is a "conditio sine qua non" for a ship building and timber exporting place; and the Pegu forests abound in excellent material for this purpose—the heads of trees felled long ago and large branches, in many parts, actually strewing the forests.

Another point of great importance is the bringing down of seasoned timber of *other* kinds. The plan proposed is, to bring down logs of such kinds only as are likely to afford valuable material for various purposes. A list therefore has been drawn up, containing the more valuable forest trees of Pegu, and a few hundred trees of each kind and of suitable sizes have this dry season been girdled in the different forests of the province. The logs, when seasoned, will be brought down to Rangoon and sold by public auction. This, although in the beginning it is more likely to be a cause of expenditure than a source of revenue, will serve gradually to ascertain the real value of other kinds of timber for practical purposes.

It is not expected that the use of Teak will be diminished by the introduction of other kinds of wood, but there are many objects for which Teak timber is less suitable, as for oars, furniture, carving, carriage building, &c., &c., and it is this that has been kept in view in the selection of the different kinds of trees to be brought down.

The first timber that will thus be sold will be the trees girdled by Dr. McClelland in the Magazee forests.

8. The measures taken for the protection and improvement of

Measures taken for the protection and improvement of the forests.	Teak in the forests are progressing favorably.
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It has, however, been necessary, in accordance with the forest rules, to exempt several large tracts of mountains east of Toungoo from the operation of those rules which are liable to place a restriction upon Toungya cultivation. These regions are inhabited by Karens, and comparatively densely peopled. These Karens do not, like those

scattered about on the hills between the Sittang and Irrawaddie valleys, select the localities for their Toungyas at random here and there in the original forest, shifting the site of their village almost every year, but, compelled by the limited space at their disposal, and further induced by the betel gardens they have planted, they are more steady in their habits, and have actually arrived at something like a regular system of rotation, each Toungya being left to lie fallow for 3 or 4 years, after which time the jungle is again cut and burnt, and paddy sown.

A large portion of these mountainous tracts thus under permanent Toungya cultivation, has, in former years, been covered with valuable Teak forests, and numerous Teak trees, though with their branches lopped every third year, in order to increase the otherwise scanty materials for burning, are still to be found in every one of these fields.

If the rules prohibiting the cutting of a Toungya on a locality with more than 50 Teak trees were here to be enforced, the inhabitants would have no alternative but to starve or leave the country.

Fortunately, however, the mountains on which Teak here grows, rising as they do to a height of 2700', and the valleys between, being deep, narrow, rocky and tortuous, present so many difficulties to the bringing away of timber, that permission (according to Rule XI.) for cutting Toungyas may be granted without violation of the forest rules.

Regarding the measures that are being carried on for the extension and improvement of the forests, it may not be out of place, to repeat what has been stated in former reports, viz. that they are of necessity of a different nature from those adopted in Europe. Few persons that take an interest in forests can be persuaded that planting and pruning are *not* measures of the first importance, in the Teak forests of British Burmah. The fact is, that in almost every forest, seedlings are springing up abundantly and that the danger from jungle fire to which young Teak is exposed everywhere, is so great, that time, labour and money are more advantageously expended, in protecting the seedlings that spring up by themselves, than in planting new ones. Yet there are exceptional cases.

Thus, in the carrying on of those operations, the object of which is the consolidation of limited tracts in every forest district now only in part covered with Teak, and situated close to a waterway, sowing and planting will be unavoidable.

The case as regards pruning is similar. All trees, if growing on suitable soil, and that have any tendency to straight growth, gradually clear themselves more or less of their lower branches, and form a straight undivided stem, provided they are growing up close to each other, for they are likely to straggle when isolated.

Teak possesses this property, common to most forest trees, in a remarkable degree. Teak trees therefore, as a rule, have straight and tall stems; for they almost invariably grow up close together, or mixed with other trees. An irregular mode of growth, however, is frequently caused by other circumstances, most commonly by their being attacked by creepers, which in some forests are found attached to one-third or more of the larger trees. A bamboo overhanging a young tree, or the shade of any larger tree too close to it, or other causes of a similar nature, have frequently the same effect.

Before correcting the growth of the tree by pruning therefore, we must first remove these causes of irregular growth, and when this is done, it is generally found that nature manages best without our aid, one of the side branches for instance taking the lead, in case the top should have been choked, or otherwise injured.

These operations, viz. the clearing of a sufficient space round young Teak trees, so as to protect them from fire, the cutting away of creepers, as well as bamboos and other trees interfering with the growth of Teak, have been carried on annually, and the result is shewn in the statement annexed.

9. The conducting of these operations on a much larger scale,

Training of the local forest subordinates.

Vide Letter from Commissioner, Pegu, dated 9th September 1859, No. 157.

and the carrying out of the improvements in the working of the forests enumerated above, are duties which must now devolve on the Assistants, at Rangoon, Toungoo and Prome, each of whom has the separate charge of one-third of the Pegu section of the forests. To the end of 1858, with but occasional exceptions, the Superintendent himself has been the only officer who has been actually employed in the forests for any length of time and who could attend to the technical part of the work. The officers in charge of the Forest Department at Toungoo and Prome have been prevented by their other public duties as Deputy or Assistant Commissioner to lend their aid in this work.

During this time therefore the measures here alluded to, could only be conducted here and there, and the training of the local sub-

ordinates could only be attempted to a very limited extent, for the large area over which the Pegu forests are spread (7312 square miles), and the great distances of the different tracts from each other, has rendered it impossible to conduct the work in more than one or two of the six divisions at a time.

But the success of the Department, both in the measures taken for working and for protecting and improving the forests will, in a great measure, depend on the degree of training to their work, which the local subordinates, forest Goungs and forest Goungways, may receive.

That it is not impossible to exercise a salutary influence over the development of their mental faculties and their energies, was seen in a remarkable degree in the work of girdling during the last season.

The Goungs and Goungways of the Southern and Tharawaddie forests, who had been employed under the Superintendent in conducting the girdling and other forest work in 1857 and 1858 were found useful, sharp and active, whereas those of other parts were dull and comparatively useless.

The appointment of these local subordinate officers on compara-

	No. of goungways on pay varying from 15 to 40 Rupees per month.	No. of goungways on 10 Rupees.
Rangoon,.....	3	18
Prome,.....	3	17
Toungthoo, .....	2	13
Total, .....	8	48

tively small pay, each of whom has his separate forest districts (in which he was born and bred) to attend to, has been one of the most important and beneficial measures of the administration of the first Superintendent of the Pegu Forests, Dr. McClelland, and if it should ever appear that the measures taken for working

the forests, and for their protection and improvement, are successful, a large share of the credit will be due to that officer who, in the midst of all the difficulties of a commencement, has laid down a sound basis upon which any reasonable system might be built with safety and advantage.

(Signed) D. BRANDIS,  
Superintendent of Forests in Pegu and Tenasserim.



## No. 1.

*Statement of Timber received and disposed of from Pegu Forests on account of the Forest Department from 1st May, 1856 to 30th April, 1859.*

ARRIVALS.		No.	Total.
No. of Logs	Received from the Forests in 1856-57,	22,226	
" "	Drift Timber received from sea shore and other places, .....	512	22,738
" "	Received from the Forests in 1857-58,	17,882	
" "	Drift Timber received from sea shore and other places, .....	235	18,117
" "	Received from the Forests in 1858-59,	12,896	
" "	Drift Timber received from sea shore and other places; .....	1,898	14,794
<i>Memo.</i>			
	Drift Timber restored to claimants, 438 logs.		
	Timber lost, but afterwards recovered as Drift Timber, .....	1,667	"
	Old Drift and unclaimed Timber, ...	540	"
Total of Drift Timber 1856-57,...		2,645	
" "	" 1857-58,...		
" "	" 1858-59,...		
		Total Logs,.....	55,649

DISPOSALS.		No.	Total.
No. of Logs	Sold in 1856-57, .....	8,297	
" "	Sold in 1857-58, .....	16,261	
" "	Sold in 1858-59, .....	20,561	45,119
" "	Expended for works at Rangoon, Timber Department,.....	838	
" "	Ditto for Prome ditto,.....	282	
" "	Ditto for Toungoo ditto,.....	54	1,174
" "	Of Drift Timber delivered to claimants on their proving their ownership thereto, .....		438
" "	Lost in 1856-57 & 1857-58, .....	927	
" "	Ditto in 1858-59,.....	740	1,667
" "	Balance in hand on 30th April, 1859,...		7,251
		Total Logs,.....	55,649

RANGOON, } (Signed) D. BRANDIS,  
The 7th July, 1859. } *Supdt. of Forests in Pegu & Tenasserim.*

## No. 2.

*Statement of amounts realized for Loozars and Doogies at the different Public Sales at Rangoon in 1856-57, 1857-58 & 1858-59.*

Date of Sale.	Amount realized for		REMARKS.
	Loozars.	Doogies.	
October, 1856, .....	17 8 0	26 5 0	
January, 1857, .....	12 4 0	16 5 0	
February, ditto, .....	3 15 0	15 11 0	
May, ditto, .....	5 9 0	10 10 0	
June, ditto, .....	7 7 0	20 10 0	
October, ditto, .....	11 5 0	0 0 0	
November, ditto, ...	13 9 0	19 12 0	
February, 1858, .....	7 15 0	16 10 0	
April, ditto, .....	5 4 0	0 0 0	
May, ditto, .....	6 14 0	15 12 0	
August, ditto, .....	0 0 0	33 3 0	
September, ditto, ...	19 8 0	0 0 0	
October, ditto, .....	21 1 0	30 14 0	
November, ditto, ...	31 0 0	49 0 0	
January, 1859, .....	23 5 0	41 9 0	
February, ditto, .....	22 4 0	28 14 0	

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu and Tenasserim.*

RANGOON,  
The 7th July, 1859. } ,

*General Statement of Expenses incurred and Revenue realized during the years 1856-57, 1857-58 & 1858-59.*

Expenditure.	Amount.	Per centage on the whole.	Revenue.	Amount.
By Pay of Officers and Establishment, .....	1,29,952 0 0	21.28	By Revenue realized by Sale of Government Timber, .....	5,63,242 1 1
" Contingencies—including all travelling allowances, .....	16,084 9 8	2.63	" Miscellaneous Revenue, .....	34,300 10 6
" Expenses incurred on account of Girdling, Forest Work, Plantations and Gardens, .....	59,892 3 0	9.81	Total of Revenue, .....	5,97,542 11 7
" Works at the Timber Depot, ...	34,617 4 1	5.67	Excess of Expenditure over Revenue, .....	12,937 15 8
" Timber Expenses, .....	3,69,934 10 6	60.61		
Total, Rs.	6,10,480 11 8	'	Total, Rs.	6,10,480 11 3

*Memo.*—Value of Timber in hand on 30th April, 1859, 6,967 logs, all paid for, Rs. 1,27,365 7 6  
Deduct excess of expenditure over receipts, ..... " 12,937 15 8  
Value of assets, Rs. 1,14,427 7 10

RANGOON, }  
The 7th July, 1859. }

(Signed) D. BRANDIS,  
*Suplt. of Forests in Pegu and Tenasserim.*

*Statement of Forest Work done in 1856-57, 1857-58 & 1858-59.*

[ 19 ]

Year.	No. of Division.	Name of Division.	No. of Teak Trees Girdled.	No. of Teak Trees marked to be Girdled hereafter.	No. of creepers cut.	No. of Teak seedlings cleared of dry grass and brushwood.	No. of other Trees near Teak Trees Girdled.	No. of seasoned Teak Trees lopped.	REMARKS.
1856-57.		See Report on the Pegu Forests for 1856, para....	Para. 32. No. 2.	Para. 32. No. 1.	Para. 158	Para. 146.	Para. 164.	Para. 145.	
"	I.	Tharavadiie Forests by Superintendent and Temporary Assistant Lt. Maude; 14th M. N. I., .....	50,018	2,68,368	21,746	..	..	..	These are fallen Trees or Trees felled, but left by the workmen with their branches on them. Such Trees are naturally more exposed to destruction by jungle fires, and less easily kept clear of dry grass and brushwood, than logs from which the roots and branches are lopped off. In forests where a Contractor is steadily at work, this is done by him, but there are several forests from which no Timber has as yet been removed.
1857-58.	II.	Prome Forests by Superintendent, .....	36,359	1,78,782	6,286	..	..	..	
"	IV.	Southern Forests by Superintendent, .....	44,272	..	20,804	..	..	..	
"	"	Ditto by Forest Goungways, .....	..	..	25	..	302	..	
"	V. & VI.	Sitang ditto by ditto, .....	326	..	Not Registered.	..	5,067	..	
1858-59.	II.	Prome ditto by ditto, .....	..	..	6,554	..	11	..	
"	IV.	Southern ditto by ditto, ..	..	..	184	..	..	..	
"	VI.	Eastern Sitang Forests by Superintendent and Asst. Superintendent, .....	13,968	..	10,080	96,780	..	398	These are Teak Trees attacked by parasitic ficus which are girdled to prevent their becoming entirely encircled and useless.
"	V. & VI.	Sitang Forests by Forest Goungways, .....	460	..	475	11,312	6,082	..	
"	II.	Prome Forests by ditto, ....	..	..	6,877	..	7,961	..	
		Total. ...	1,45,403	4,47,160	73,031	1,08,092	19,423	398	

RANGOON, }  
 The 6th August, 1859. }  
 (Signed) D. BRANDIS,  
*Supdt. of Forests in Pegu and Tenasserim.*

## PROGRESS REPORT ON THE PEGU FORESTS, FOR 1859-60.

1.—In this my Fourth Annual Progress Report on the administration of the Pegu Forests, it is intended

Introductory remarks. first to give a short sketch of what has been done in the survey of the Pegu Forests; second, to discuss the method employed in, and the results obtained by, the working of the same; thirdly, to state what has been done for the protection and improvement of the Forests; and lastly, to add some remarks concerning the Assistants and subordinates of the Department.

2.—The method of Forest Survey has been described in other

Extent to which the Forest Survey of the Pegu Forests has been conducted.

papers on the Forests of these provinces,\* and it appears unnecessary here again to refer to it.

\* Report on Attaran Forests, para. 3, Progress Report on Tenasserim and Martaban Province Forests, para. 4.

It consists of the Topographical Survey, and the Forest Survey proper.

Since taking charge of the Pegu Forests, I have visited the greater portion of the same with a view to form an idea of their extent, timber resources, and general character; but a regular Forest Survey has been conducted only in the portion mentioned below, and even this survey as yet only deserves the name of a preliminary one, and we must consider its results as subject to correction and alterations hereafter. Indeed the circumstance of the Teak trees being scattered over wide extents of forests of other kinds, renders every Forest Survey an attempt at approximation only, and it will necessarily be a long time before we may venture upon what can be termed a valuation of the Forests.

This operation which in the consolidated forests on the continent of Europe is the first care of the forester, necessarily preceding all arrangements for the management of his district, cannot be attempted satisfactorily in the Teak Forests of Burmah until a portion of the materials shall have been yielded by the working of the Forests; and the first Superintendents of these forests must incur the risk of building their plans upon insufficient and uncertain data. Forest Surveys were conducted in the—

First Division, Tharrawadie Forests, in 1857, by the Superintendent and Lt. Maude, 14th M. N. I. and, in 1858, by the Superintendent alone.

Third Division, Western Forests. The greater portion of those situated in the Promo and Henzada district, by Mr. Clemen in 1860.

Fourth Division, Southern Forests the Thounzay, Oakken and Magayn Forests, and a small portion of those on the Pounclin and on the tributaries of the Pegu river, by the Superintendent in 1858.

Sixth Division, Eastern Sittang Forests, Padah Moong, Youkthawah, Thoukyaghat, Kanneo, Koonong Forests by the Superintendent and Mr. Clemen in 1859.

A few Forest Surveys were made in 1856, in the 1st, 2nd, and 5th divisions, but on a more rough plan than the present one. They are noticed in paragraphs 4, 5, 6, of the Pegu Forest Report for 1856.

The Topographical Forest Survey has not yet progressed sufficiently to admit of Forest maps being published. In some Forest

Tharrawaddie District.

Prome	"
Henzada	"
Bassein	"
Hlyne	"

Districts, the maps of the Pegu Survey Departments are of great value, as they give a considerable amount of detail on that part of the country where

Teak is found. We now proceed to notice the several divisions of the Pegu Forests in their order.

3.—The general results of the Forest Survey conducted in the Tharrawaddie district are exhibited in Appendix 3 of my Attaran Report.

Tharrawaddie Forests.

Average No. of trees on the square mile in the tracts surveyed.

First class,.....	992
Second „ .....	751
Third „ .....	1778
Fourth „ .....	2567

The area surveyed was 12.56 square miles, and on this area were counted 76,469 Teak trees, of which 12,461 belong to the first class. The total area covered with Teak-producing Forest is

estimated at 580 square miles, and on this area are estimated to stand 575,360 Teak trees of the first class.

The streams draining the Tharrawaddie Forests rise on the Western slopes of the Pegu Yomah, and after pursuing a south-westerly direction join the Meimakha river, a remarkable stream running parallel to the Irrawaddie. It takes its rise south-east of Prome and, known in its lower course as the Hlyne river, joins the Delta of the Irrawaddie above Rangoon. Throughout the upper part of its course the Meimakha is separated from the Irrawaddie by high undulated ground, and here Teak is found scattered throughout the Bin and bamboo jungles that cover these hills. A considerable number of planks were, during the

Burmese times, cut in these localities, and shipped at Taropman, on the Irrawaddie. South of the latitude of Kyangyeen, however, low ground commences, inundated during August and September, and to a great extent intersected by numerous creeks, which join the two rivers in the rains.

4.—The general distribution of Teak in the Tharrawaddie district has been noticed in the memorandum on the Tharrawaddie Forests attached to my first Forest Report, dated 16th December, 1856. A belt of dry *Dipterocarpus* (Ein) Forest, which stretches north and south through the entire district, separates the lower forests from those on and near the hills. The lower forests, although much worked out where the timber could with facility be removed, still contain an abundance of splendid timber, wherever the distance from a stream that admitted of floating, or other circumstances, rendered working difficult.

The Kangyco Forest in the Mimboo district is a remarkable instance.

This forest is situated on an extensive flat. The best Teak localities in the same are distant about 8 miles from the Mimboo Choung, which is the nearest water-way fit for floating. The area of the teak-producing tracts in this forest is estimated at about six square miles, and the number of first class trees that were marked in 1857, was 5310; of those 1345 were girdled, a large proportion of which were trees above 9 feet in girth.

The seasoned timber at present in this forest, the trees girdled in 1857, and a number of trees fallen, Nathat, or girdled during the Burmese rule, may be estimated to yield, if carefully worked, 2500 tons of sound timber, expected to realize at the Government timber scales (@ Rs. 25 per ton) Rupees 62,500. But this timber can only be effectually removed by carts and by sawing up the largest trees into planks and squares so as to decrease their weight.

5.—The forests between the foot of the hills and the belt of Ein forest, are considerably richer, and contain some of the most valuable teak localities in the province, abounding in large timber, and yet not generally offering great obstacles to the removal of the same. As an instance of this group, it may suffice here to mention the Tyemyonk forests, between the Minhla and Myoung Choung at the foot of the

Middle Tharrawaddie Forests.

hills which divide these two streams. This forest is on undulating ground, the largest trees are standing on small hillocks, and around them, on belts of rich alluvial soil, young trees are springing up in abundance. In some parts of this forest as many as 5900 first class trees on the square mile have been counted.

This forest has been protected by its distance from streams admitting of floating timber and here also sawpits and carts will have to be introduced to ensure an effectual working of the timber resources.

6.—But the forests on the spurs and ridges, which stretch from the Pegu Yomah into the plains, are the finest and by far the most extensive.

Upper Tharrawaddie Forests.

The number of first class trees per square mile on these hill forests does not attain such high figures as in some of the forests on the plains, but the straight stature of the trees is excellent, their stems are tall, almost cylindrical, and with a smooth surface.

Every one of the eight great forest districts into which the Tharrawaddie Forests are divided, has its main resources of timber in the hill forests, but the finest tracts are those on the feeders of the Boben and Tounyo Choungs, where Teak has not suffered much from Toungya cultivation, and where it has only been worked to a limited extent owing to obstructions in the bed of these rivers where they enter the plains. Indeed the Teak trees in these two forests are, as regards beauty of growth and height of stature, fully equal to those on the Salween, beyond the British boundary, nor are large trees rare in these forests. On the 17th and 18th April, 1858, I counted on 137 $\frac{1}{2}$  square miles in the Yan Choung forests, 1092 first class trees of which 163 were in girth between 6 and 9 feet.

7.—The Boben and Tounyo forests, like many others in Pegu, owe

Obstructions in the streams of the Tharrawaddie District.

their present value to certain obstructions, which have rendered their streams useless for the floating of timber. These mountain streams emerge from the hills with great velocity and carry with them a large quantity of sand, driftwood and rubbish of all kinds. Where they enter the alluvial plains, the fall of their beds is considerably less, and the current being slackened, a large quantity of sand, driftwood, and rubbish, is deposited. These deposits would probably be less considerable, if the rise and fall of the water were not so irregular.



But as the mountain torrents are only fed by the violent, but by no means continuous, bursts of rain during the south-west monsoon, their waters fall as rapidly as they rise, and a few pieces of driftwood, left by the receding stream, are sufficient to cause the silting up of a clear bed, and thus originate an obstruction fatal to the floating of timber. Such obstructions generally form at a distance from the foot of the hills, greater or less according to the nature of the country. A new channel is often formed that produces well, but which, in its turn, is frequently subjected to a similar process, and after the lapse of years becomes useless for the purpose of floating timber. The Bohon Choung, for instance, has had during the last fifty years three outlets. The present one (Tsin Choung) was formed three years ago in a westerly direction, but this outlet is open only for about six miles, beyond the old obstruction, where it is rapidly being blocked up by sand and rubbish, so that now a canal is under construction, opening out one of the old courses of this stream in a south-west direction.

Canals with a well regulated fall are the only remedy, and these will have to be kept clear, by the constant floating of timber when the water is high, and by dragging it through them by means of elephants when the water falls.

A large proportion of the hill forests in the Tharrawaddie district has been protected by obstructions of other kinds formed by rocks in the bed of the channel. Such obstructions must be opened by the blasting of the rocky barrier.

It is well worth while to incur some expense in the removal of these natural difficulties, as they at present render unavailable more than two-thirds of the Teak in the Tharrawaddie district, and that trees of straightest growth, and with the most regular stem.

8.—Of other trees, first *Toukkyan*, (*Pentaptera macrocarpa*, Wall.)

Other trees of the Tharrawaddie Forests. *Yoonben* (*Conocarpus*, sp.) may be said to be characteristic of the lower Thar-

rawaddie Forests, whereas in the middle and hill forests they are associated with, *Pynkadoc* (*Inga xylocarpa*) the latter often prevailing; *Myoukshaw* (*Blackwellia tomentosa*) is found throughout the forests associated with Teak and the bark rope tree *Shawben*, (different species of *Sterculia*), with *Guayben* (*Spondias mangifera*), are common in the hills. The whole of the Teak localities of the Tharrawaddie district are annually visited by jungle fires.

The summits of the Yomah range are generally covered with patches of evergreen forest of Theyah (*Shorea obtusa*, Wall.) with oak (*Quercus semiserrata*), *Eugenia*, sp., and others. Teak is wanting on these summits, although their height (about 2000') does not reach the upper limit of Teak in the mountains between the Sitang and Salween rivers.

9.—With reference to the proportion of the Teak trees of different classes, we find all modifications. The proportion of Teak trees of different classes in the Tharrawaddie Forests. A forests, in which the number of first class trees exceeds twice that of the second, prevail in the hills, especially where the Teak has not been much worked out. The B and C forests are more common in the plains.

Taking them as a whole, the first class trees exceed the number of the second, but form only two-fifths of the total of second and third class trees.

10.—Leaving the length of rotation to be determined, in every particular tract, by the character of the Forest, we may say that, upon the whole, thirty years are sufficient to ensure a sufficient number of the second and a portion of the third class trees coming up to the standard of the first class. But one-half of the Tharrawaddie forests may, at present, be considered as impossible to work. We substitute therefore  $\frac{1}{6}$ th instead of  $\frac{1}{3}$ th.

Assuming the above estimate of 575,360 trees as correct, we may expect an outturn of 9,589 trees per annum. This would admit of 57,536 trees being girdled once in 6 years. The number girdled in 1857 was 50,018.

But it must be borne in mind that this timber can only be brought away from the Tharrawaddie district, in case the streams are cleared by blasting the rocks, by digging canals or by other means, and that a very large force of elephants, well trained to timber work, and skilled foresters well acquainted with their forests, will at all times be required. For only in the lower forests in the plains can bullocks or buffaloes with advantage be employed. The work in the hills is of the same nature and not less difficult than in the Shan and Karenee Forests.

Supposing the streams were all cleared of obstructions and 9000 logs were to be removed annually, this would require 75 elephants for the Tharrawaddie district alone.

11.—The Tharrawaddie forests are upon the whole favorable for,

Future prospects of the Tharrawaddie Forest Seedlings.

the springing up of seedlings. It is true that in some old, very shady forests seedlings are wanting, but they spring up abundantly wherever a clearance is made in the plains. Wherever a few Teak trees are near, seedlings spring up in such abundance that, within sixty or seventy years, wide extents of valuable Teak-producing locality may be expected to have taken the place of valueless jungle.

This favorable result is entirely due to the introduction of strict forest rules which ensure the protection of Teak, while they permit the cutting down of trees of all other kinds.

The principal duty of forest Goungways in these tracts will be, to protect the seedlings from fire, to keep the trees clear of creepers, and in some instances to free them from the injurious shade of bam-boo and other trees.

12.—The annual fires, creepers and the epiphytic ficus are the

Enemies of Teak :—creepers and epiphytic ficus.

enemies of Teak in the Tharrawaddie, as well as in all other forests. Creepers are most destructive in the plains, where often through entire tracts not a single large tree can be found with a stem without a bend, or some other irregularity indicating the injurious effect of a creeper covering the tree while young.

The epiphytic ficus is most common on the hills. I find it noted in my journal that in the Yaitho Forests, Beeling district, on the 10th of February, 1857, all the trees marked for girdling were attacked with epiphytic ficus, amounting to one in four trees of the first class.

13.—The Tharrawaddie forests are better known than any other

Examination of the Tharrawaddie Forests.

division of the Pegu Forests. Dr. McClelland passed through the lower part of the district in 1855. I examined a portion of the Minhla and Mokka Forests in May, 1856; and in company with Lieut. Maude, 14th Madras, N. I. then Assistant in the Forest Department, went through the greater part of the middle forests, situated between the belt of Bin forest and the hills, examining also some of the hill forests. In 1858, I went through the whole of the hill forests from south to north, following the line of the Pegu Yomah; and in 1860, I had repeated opportunities of examining such as I had not visited before.

It is necessary to mention these data, on which this summary

description of the Tharrawaddie Forests is based, as without a certain familiarity with a forest district, it is not safe to draw general results from the more figures of this forest survey.

14.—The inhabitants of the Tharrawaddie district near the forests

Inhabitants.

have of old been accustomed to timber work. There is a string of Karen

villages in the hill forests. The inhabitants live upon the produce of their hill clearings, paddy, cotton, and sesamum oil, but have had little to do with timber, except girdling, and occasionally felling. The main work has invariably been done by the Burman inhabitants of the villages in the plains and near the lower forests. Some of the best timber shipped from Rangoon before the British occupation, came from the Tharrawaddie district. At that time buffaloes only were employed, but the foresters had acquired such skill in managing them, that large mast pieces of 80 feet length were not rarely sent down to Rangoon. Much of the timber at that time was squared in the forest by the axe; a wasteful process, but ensuring the bringing to market of sound timber only.

The Tharrawaddie forests were actively worked up to the definitive closing of the forests on the 1st January, 1856. When at that time it was resolved not to stop the work, but to carry it on on Government account, the old foresters could not comprehend the change of system and were unwilling to enter into engagements with the Forest Department. It was, with the greatest difficulty, and only by dint of personal entreaties that I succeeded in inducing a number to undertake the bringing down of timber in 1856-57. To carry on the work more effectually, it became necessary to introduce foreigners. Since then three of the best forests, Beeling, Gamoong, and Tounyo, and several minor ones, have been worked by parties from Maulmain, Karens, Burmese, Talines, experienced foresters with elephants. This, in its turn, excited the jealousy of the natives; who now complained that they had been neglected and injured.

15.—Yet it is indispensable, to a certain extent, to maintain the

Necessity for introducing foresters from abroad.

influence of foreigners in the working of the Tharrawaddie forests. The natives here are, more than other Burmans, intent upon disputes and intrigues.

You give a contract to a company of three. The geographical

You give a contract to a company of three. The geographical

character of the forest does not well admit of a division, and the means of one man alone are not sufficient. The parties are in perfect harmony at the time the contract is concluded, but preparations for work once commenced, disputes begin, and the end of the season sees them bitter enemies; with little timber, but with endless complaints against each other, and the better part of the working time is spent in disputes and lawsuits about each other's timber.

Or the contract is given to one party only. He has not sufficient means himself, but employs others by giving them sub-contracts, the timber is expected in December. But instead of the logs, come reports about parties being prevented from working through some intrigue or other: the timber is detained because the contractor has not kept his word to his sub-contractors, or instead of looking after the floating down of his timber, the head man is in jail, and such are the unsatisfactory results of a most unsatisfactory mode of dealing. Many of the Tharrawaddie foresters themselves feel the disadvantage of this state of things, so that they are glad to be placed under the authority of some one from abroad who is not mixed up with any of their intrigues.

They fully appreciate the honest and business-like dealings of some of the Christian Karen foresters, who, often mere boys, but with some education, and the feeling of honesty developed in them, easily gain confidence and authority among them, and who consequently from year to year maintain and strengthen their position, amid the endless and most unsatisfactory changes of other foresters.

16.—The Tharrawaddie Forests have, since 1856, yielded the following timber, the whole of which, with the exception of a few hundred logs, was old seasoned timber.

Yield of timber from the Tharrawaddie forests.

Year.	Logs.	Tons.
1856-57,	3,502	2,000
1857-58,	5,781	4,110
1858-59,	5,205	3,810
1859-60,	4,312	3,255
<hr/>		
Total,	18,800	13,601

The amount of old seasoned timber still remaining is estimated at

11,100 pieces. If to this are added the 50,018 trees girdled in 1857, the total stock of timber available from these forests, for the next 6 years amounts to 64,618 logs. But it must be remembered that of this number a large proportion is in localities as yet closed by obstructions in the water-way or from other causes difficult to work.

17.—The second Division comprises the Prome Forests on the east side of the Irrawaddie river. These forests are divided into three great groups.

The southernmost are those on the Shwoeley Choung, the highest feeder of the Mimiakha river which it joins west on Pongdal. The next are situated on the six branches of the Nawing Choung, and the northernmost are drained by the branches of the Boolay Choung which rise in the hills near and beyond the British frontier.

No regular forest surveys has as yet been taken of any considerable portion of these forests. Yet they are sufficiently known to enable us to form a general idea of their character and resources. Dr. McClelland examined a portion of the Nawing Forests in 1855. I visited the same district, in 1856. From March to May, 1857, when superintending the work of girdling in that division, I had a good opportunity of becoming acquainted with a considerable portion of the Prome Forests. In the northern part of the Prome district, low undulating hills stretch down nearly to the banks of the Irrawaddie. They are covered partly with Ein (*Dipterocarpus*) forest, partly with dry deciduous bamboo forest almost exclusively composed of Minwa (*Bambusa stricta*, Roxb.) intermixed with Shaben (*Acacia Catechu*) and a few other trees of the dry forest. Teak is scattered throughout these hills; but the trees rarely attain a considerable size, and are not of regular growth. Yet from these forests (especially those near the frontier north of Thabalah) large quantities of long and fine split planks, Shinbyins, have been removed during the Burman rule and afterwards by the Forest Department contractors, but a considerable number still remain. In the southern part of the Prome district plains intervene between the hills of the Yomah, and those near the Irrawaddie.

Here also, there is some Teak, and a remarkable locality (the

Royal Forest near Emmah) has been noticed in the memorandum on the Teak in the Tharrawaddie, attached to the Pegu Report for 1856.

18.—The main value of the Prome Forests consists here as in the Tharrawaddie district, in the hill forests. Their character is similar in the two districts, but some valuable trees of other kinds, rare to the south, are associated with Teak in the Prome hills. These are a species of Padouk (*Pterocarpus* sp.) and Kokohben (*Dalbergia* sp.) The wood of both is prized for the construction of cart-wheels, and under the Burman rule, a tax was levied on the cutting of these kinds.

The hill forests on the branches of the Boolay and Nawing streams have been much worked out, so much so, that it is necessary to proceed one or two marches into the hills to reach really valuable Teak localities.

There are a few obstructions formed by rocks in some of the feeders of the Nawing, but the main stream in its lower course is perfectly clear, and this, together with the vicinity of Prome, accounts for the exhausted state of the forests.

19.—The Shwoelay Forests have hitherto been preserved almost intact by the stream having been blocked up with sand and rubbish in the plains west of Pougdeh. The bed of the river above this obstruction is 20 feet deep and 100 feet wide; but below the village of Weppoke its depth is only 3 feet and its width 40 feet; and further down it divides into numerous streamlets, which reunite in one channel, about two miles below the head of the obstruction. Only small pieces of timber have hitherto been brought away once only.

20.—About eleven years ago a Myoke of Mogouk is said to have floated down several hundred large logs, and dragged them up the Meimakhka to Prome, where they were used in building Zayats and Kyoungs. But the channel that was open at that time has since silted up, and in order to render the seasoned timber in the forest available, it became necessary to dig a canal.

This canal has been completed during the last dry season. It is 7,270 feet long, and has a depth varying from 4' 10" to 6' 2," with a fall of nearly one foot in a 1000, and a width of 24 feet above and 12 feet at bottom.

21.—The forests on the feeders of the Shwoelay and its principal tributary, the Shaboung, are probably some of the richest Teak forests in Pegu. The area covered with Teak localities is estimated at 25 square miles in the Shaboung, and 70 in the Shwoelay Forests. In both 19,371 first class trees were girdled in 1857, and 83,921 marked. But the marking of all first class trees was not half completed, and we may assume that their average number per square mile is between one and two thousand.

Some parts are much richer. The Kokec Forest, for instance, in the Shaboung district between the villages of Jobin Bin and Thamadeo has an extent of about six square miles, and contains 21,202 full-sized trees (marked in 1857), of which 3,793 trees were girdled. This is at the rate of 3,533 first class trees per square mile, or five trees per acre. This tract was first noticed in 1856, by Major Brown, then Deputy Commissioner of the Tharrawaddie District.

A disadvantage in the Shwoelay Forests is the scarcity of water in the dry season, near the best Teak localities.

Some expense will have to be incurred in digging wells, to enable timber cutters and sawyers to carry on their work during that time. There are also rocks obstructing in several places the course of the Shaboung and Shwoelay rivers, but these can be removed by blasting.

22.—The total Teak-producing area of the Eastern Prome Forests, may be estimated at 320 square miles, and the number of first class Teak trees on the same at 250,000. There is a sufficiency of trees of the smaller classes, and an abundance of seedlings. But, as many of the forests are much impoverished, it may be better, on an average, to season only  $\frac{1}{6}$ th of the first class trees annually, which would yield an annual outturn of 5000 trees, provided all water-courses are opened out. About 30,000 trees may be girdled once in six years. The number girdled in 1857 was 36,359.

23.—The inhabitants of the Prome Forests have long ago been in the habit of working their forests, and, with the exception of the southern portion, comparatively little seasoned timber remained in them, when the working of the forests on Government account commenced.



This, and the difficulty experienced in finding suitable assistants for the Prome district, accounts for the comparatively small supply of timber derived from this division. It has been as follows :—

Year.	Logs.	Tons.	Remarks.
1856-57,	1,188	656	* The greater
1857-58,	5,183*	1,302	portion of this
1858-59,	811	603	timber consisted
1859-60,	551	291	of small pieces.
<hr/>			
Total	7,763	2,852	

There is, however, still a quantity of old seasoned Timber remaining in the Prome Forests. It is estimated to amount to 8,600 pieces. The number of trees girdled in 1857, was 36,859, so that the total amount of seasoned timber available for the next six years may be estimated at 45,459 pieces, the removal of which, however, will require the opening of some water-courses now obstructed, and other arrangements to make the timber accessible.

24.—The third division comprises the whole of the forests on the west side of the Irrawaddie river, from the frontier to the neighbourhood of Bassein. This division is the most extensive, but at the same time the poorest in large trees.

Division of Western Forests.

25.—The Teak localities are situated on the following tributaries of the Irrawaddie river.

- |                   |   |                                      |
|-------------------|---|--------------------------------------|
| Prome District,   | { | 1. Matoong Choung.                   |
|                   |   | Its principal feeders Panceo Choung. |
|                   |   | Matoong.                             |
|                   |   | Chlon Choung.                        |
|                   |   | 2. Mudday Choung.                    |
|                   | { | 3. Shwoetingah ditto, and            |
|                   |   | 4. Thallaidan ditto.                 |
|                   |   | 5. Padashin ditto.                   |
|                   |   | Its feeders Aloon Choung.            |
|                   |   | Padashin ditto.                      |
| Henzada District, | { | Pado ditto.                          |
|                   |   | 6. Manya Choung                      |
|                   |   | 7. Kanyin or Opho Choung.            |

Bassein District, { 8. Kwingouk Choung,  
9. Khattoo Choung,  
10. Kyouk Chounggeley, } West of the Bas-  
sein creek.  
11. Aloon Choung, on the east side of the  
Bassein creek.

26.—These forests were surveyed by Mr. Clemen, Assistant,  
Forest Department, from January to  
Survey of Western Forests. April, 1860, and a portion of those in  
the Prome district were visited by  
General Results. myself in February of the same year.

The results of these surveys are exhibited in Statement I., showing an  
abstract of the whole of the Forest Surveys hitherto made in the Pegu  
Forests, and in Statement II. exhibiting the number of trees per  
square mile. The total area surveyed in the Western Forests was  
11.86 square miles, and on this space 135,370 Teak trees were counted,  
of which 15,483 were of the first class. It is not possible to venture  
upon an estimate of the area covered with Teak-producing forest in  
this division, but it does not appear likely that the number of first  
class trees available in the Western Forests is much larger than  
60,000, which, supposing  $\frac{1}{10}$ th of them might be removed, would yield  
an outturn of 1,200 trees per annum.

The Western Forest districts offer a great variety in their general  
character, hence it appears advisable to review the different districts  
separately.

27.—The forests drained by the Matoong Choung and Mudday  
and its branches are the only Teak-  
Matoong and Mudday Forests. producing tracts, west of the Irra-  
waddie, that bear comparison with the forests of the other divisions

Average number of trees per square  
mile in the Matoong Forests, on the  
hills.

First class, .....	2543
Second „ .....	3989
Third „ .....	5546
Fourth „ .....	6829

in Pegu. Both the Matoong and  
Mudday Choungs rise in the hills of  
the Arrakan Yomah, and empty them-  
selves into the Irrawaddie. They drain  
an area of about 1400 square miles,  
one-tenth of which may be considered as producing Teak. The  
Matoong Choung is the largest tributary joining the Irrawaddie river  
within the boundaries of Pegu, and has sufficient water to admit of  
floating timber nearly throughout the year. The Mudday Choung has

only a trickling stream of water throughout the dry season. Nearly the whole country drained by these streams is hilly. The hills extend to the banks of the Irrawaddie, with a break near Kama, through which both rivers empty themselves, the distance between their mouths being not more than four miles. There is also some level ground, varying in breadth, along the valleys of these rivers.

On the hills, Teak is found scattered, from the higher ridges of the Arracan Yomah to the banks of the Irrawaddie; but in the eastern part of the district large trees are very scarce, and dry Bin (*Dipterocarpus*) forest with stunted trees, covers a considerable proportion of the surface.

On the slopes of the Arracan Yomah, Teak does not generally rise to any considerable height: the greater part of the higher hills is covered with dense bamboo jungle or with evergreen forests. On the lower hills between the Pance and Mudday Choungs, the Forest Survey has given only 74 first class trees on the square mile, but a large number of trees of the second and third class, and these of very good growth. Yet even these lower forests have at one time yielded considerable supplies of Teak timber, especially of split planks.

Near the sources of the feeders of the Matoong and Mudday Choungs, the number of large trees is greater. But the Teak has everywhere suffered severe injury from *Toungya* cultivation. Forests with from 3 to 6000 first class trees on the square mile, are not rare, but most large trees have been mutilated by *Toungya* cultivators.

Only a few tracts near the hills have been spared. Thus Mr. Clemen found a fine tract of Teak Forest on the Yain Choung, east of Mindoon, with an abundance of trees of tall and straight growth.

The number of first class trees counted on this tract was 1537, (on about 160 acres), of which there were in girth between 7' 6" and 9 feet, 630, and above 9 feet, 724.

Another fine Teak forest, comparatively little disturbed by *Toungya* cultivation, was examined between the Moo and Pathee Choungs, not far from the northern frontier. The total number of first class Teak trees here was 958, corresponding to 3,200 first class trees per square mile, of which 148 were above 9' in girth, and 230 above 7' 6". Another tract with Teak of fine growth was found on the Mhau Choung, where on a quarter square mile, 338 first class trees were counted, of which 175 had a girth between 7' 6" and 9' and 30

a girth above 9'. The number of forked trees observed in the Matoong forest was 2,106, on an area of 6.22 square miles. Of these 1517 were in girth below 6 feet. These forked trees are the product of Toungya cultivation. The cultivators cut down the green Teak at two or three feet from the ground. The stump frequently brings forth side-shoots, often as many as five, and ultimately, after dying off, remains in the centre, surrounded, and sometimes even covered, by the stems, some of which occasionally attain a considerable girth. A representation of some of these irregularities, as observed by Mr. Clemen on the hills between the Thadoon and Panee branches of the Matoong Choung, is given on Table I. These forked trees are observed wherever Toungya cultivation has been carried on to great extent in Teak-producing tracts. The hills east of Toungoo, the Salween and Yoonzaleen Forests, and here and there limited tracts on the Pegu Yomah, offer numerous instances of a similar mutilation of Teak. In some instances such forked trees do not arise from Toungya cultivation, but are the remains of timber felled green, without having been previously girdled. Thus in the Attaran forests we are enabled from the size of these side shoots (stavens) to determine the time at which the foresters were in the habit of cutting green timber.

And some of the forked trees in the Western Forests may derive their origin from the practice of the villagers of splitting green timber into shinbyins.

The number of stumps observed in the Matoong forests was 1874, nearly the whole of these were in girth below 6', and the result of Toungya clearings.

The proportion of the trees of different classes in the Matoong Forests, promises well for the future development of these forests.

The number of second class trees is considerably larger in all instances, than the number of first class trees, and so is the number of third and fourth class trees. Seedlings indeed are springing up everywhere in profusion. Thus a short rotation of  $30 + 62 = 92$  years is justified.

28.—The Mudday Forests are in many respects like the Matoong

Mudday Forests.	Forests, but contain a smaller proportion of large trees. Mr. Clemen found
Average number of trees per square mile.	403 first class trees on 1.2 square mile, of which number 23 were in
First class, .....	girth above 7' 6" and the remainder
Second " .....	between 6 feet and 7' 6". To deter-
Third " .....	
Fourth " .....	
448	
987	
1917	
1560	

mine in a satisfactory manner the probable annual outturn of the Matoong and Mudday Forests, the data are as yet wanting.

The following considerations lead to some approximate results. It may be assumed that of the 1400 square miles drained by the Matoong and Mudday Choungs, about one-tenth, or 140 miles, produce Teak. Of this area 10 square miles may be assumed as the extent of the richer forests on the head-waters of the Matoong, with 2543 trees per square mile; 2 as the extent of those on the Mudday, with 418 first class trees per square mile, and the remainder, or 128 square miles, as bearing Teak at the rate ascertained to be that of the forests to the east, viz. at 74 first class trees.

This would give

Forests on the head-waters of Matoong,	10 S. M.	25,430	1st. Cl. Tr.
" " " Mudday,	2 "	896	
Lower Forests, .....	128 "	9,472	

Total,..... 140 ,, 35,798 first

class trees on the Matoong and Mudday Forests. If worked by seasoning annually  $\frac{1}{10}$  of all first class trees, the yearly outturn would be 1193 trees. But it is very doubtful whether we are justified in carrying on girdling operations in the Lower Forests with not even 100 trees on the square mile. Deducting on this account 315 trees, 878 remain as the number which we are justified to expect annually.

Nearly the whole Teak in the Matoong and Mudday Forests is found in dry bamboo, Minwa (*Bambusa stricta*, Roxb.) forest, classed as the third group in the Attaran Report. The other trees are those usually associated with Teak, with Kokohben (*Dalbergia*, sp.?), Padouk (*Pterocarpus*, sp.), Boummayzah (*Albizzia stipularis*). In some localities a greater variety of bamboo occurs, viz. Kyathounwa (*Bambusa arundinacea*, L.), Tinwa (sp. nova?), and a species not yet identified, but called by the inhabitants Kayinwa.

A small proportion of Teak is found associated with *Dipterocarpus grandiflora* (Einben), especially on the outskirts of the Ein forest, on the hills between the Yomah and the Irrawaddie river.

29.—The Shwoetunga Choung which empties itself below Pa-doung and the Thallaidan, which joins the main river at Akouktoun, drain an area of about 800 square miles. Both have their source in the Arracan

Shwoetunga Forests.	
Average number of Teak trees per square mile.	
First class, .....	196
Second " .....	465
Third " .....	1808
Fourth " .....	1853

Thallaidan Choung Forests.	
Average number of Teak trees per square mile.	
First class, .....	202
Second „ .....	553
Third „ .....	1639
Fourth „ .....	3268

Yomah, and the Prome and Toungoop road crosses that range near the headwaters of these streams. Teak-producing localities are more scarce than in the northern districts. Mr. Clemen

only observed 434 first class trees on an area of 2.16 square miles, and of these only 4 were in girth above 9,' and 33 above 7' 6".

Yet there are some very valuable Teak-producing tracts on the side-spurs of the Yomah. Mr. Lonsdale, Assistant Commissioner, of Prome has communicated to me some notes regarding a spur between the Shwoetinga and Thallaidan Choungs, covered with fine large Teak trees, and worked during the Burmese times; and Mr. Clemen describes the Teak on the sources of the Kyeebin Choung (the southern-

Thama Choung.  
Kyoukpyoo ditto.  
Kyeebin ditto.

most of the three branches of the Shwoetinga) as being of fine growth in the small valleys, and on the foot of

the slopes of the hills; whereas on the brow of the ridges, it is more low branched and crooked.

It is also certain that these streams have yielded very considerable supplies of planks, and squared logs (doos) under the Burmese rule, and during the first years of the occupation of the country. Kyangjin and Myanoung are the places to which the timber was generally brought. The numerous large Burmese boats, for the building of which Kyangjin is noted, were mostly constructed of material

Number of stumps counted in the Shwoetinga Forest.	} above 6' in girth, 240, on 0.99 S. mile below 6' 151, on ditto.	from these forests.
		The circumstance that
" " " Thallaidan Forest.	} above 6' 656, on 1.17 S. mile below 6' 17, on ditto.	these tracts have been
		worked extensively is

apparent from the large number of full-sized stumps counted in these forests.

The trees of the smaller classes are numerous. Those below 3' in girth are about as numerous (on the square mile) as in the Mudday, Tharrawaddie, and several other of the more valuable forest districts in Pegu.

Thus the prospects of these forests are encouraging, but it appears doubtful whether we are justified in carrying on any girdling operations in them at present.

Of the total area (800 square miles) one-twentieth, or 40 square

miles may be estimated as producing Teak, at the rate of 200 first class trees, which would give 8000 full-sized Teak trees.

30.—The Padashin Choung, with its numerous branches, falls into

Padashin Forests.	
Average number of Teak trees per square mile.	
First class, .....	329
Second „ .....	1387
Third „ .....	2927
Fourth „ .....	4702

the Irrawaddie below Kyangjin Myo.

It drains about 100 square miles, its principal branches are the Aloon, Padashin, and Pado Choung. The latter is obstructed by a rocky barrier,

above which some good timber has been left standing. Teak is found widely dispersed over the plains, along the lower part of these streams, often alternating with Ein forest. The hills are steep, but the top of the ridges is frequently level, and here Teak of fine straight and regular growth is found.

But the greater part of the forests has been worked to excess, and the number of stumps is several times greater than that of first class trees. During the survey, 276 first class trees were counted, of which 11 were in girth above 7' 6". But at the same time the number of stumps observed was

Full-sized,.....	748
Under-sized,.....	505

Yet the number of first class trees remaining amounts to 329 per square mile, or more than in either the Thallaidan, Shwoetinga, Mamya or Opho Forests. If the total area producing Teak in the Padashin Forests is estimated at 10 square miles, the whole may contain 3290 Teak trees in girth above 6'.

The prospect of these forests for the future is very good. The number of second class trees on the square mile is 1387. These, it will be remembered, may be supposed to attain the standard girth of six feet in 24 years, so that if no trees are removed within that time, the forest will then have 1700 first class trees per square mile. And the number of trees of the third and fourth classes is more than sufficient to replace the trees of the higher classes.

We are justified in removing  $\frac{1}{30}$  of the first class trees from the Padashin Forests, which would yield, as far as we can form our estimates at present, about 150 trees per annum.

The Padashin Forests are very dry, and suffer exceedingly from the destructive effects of jungle fires. Mr. Clemen found (in

March) large numbers of seedlings scorched and many killed by the fires.

The natives of Kyangjin and the neighbouring villages have of old been in the habit of working the Padashin Forests: crooks, large spilt planks (shinbyins) and squared logs were the principal kinds of timber cut. The pieces were either floated down the Padashin Choung, or carted into Myanounng.

The Teak localities, south of the Padashin Forests in the Hienzada district are drained by the Mamaya, and Opho Choungs. The area drained by these rivers may be about equal to that drained by the Padashin Choung.

Mamya Forests.		the outskirts of the Ein forest. The
Average number of Teak trees per square mile.		trees are high with straight trunks.
First class, .....	214	On the 29th March, Mr. Clemen found
Second ditto, .....	912	in the Minwadoung Forest, on an area
Third ditto, .....	1266	of a quarter square mile, 102 first class
Fourth ditto, .....	1660	trees, of which 19 were in girth above
Opho Forests.		7' 6", the growth of Teak was straight
Average number of Teak trees per square mile.		and with high trunks, and only in
First class, .....	192	some few instances were the stems
Second ditto, .....	1014	crooked and short. The growth of
Third ditto, .....	897	other forest trees, especially of Pynkadoo ( <i>Inga xylocarpa</i> ), and Tonkyan
Fourth ditto, .....	1827	( <i>Pentaptera macrocarpa</i> ), was most perfect. This description, which
		indicates excellent soil, reminds one distantly of some parts of the
		Atlaran Forests, separated like these from the sea shore only by a
		narrow mountain range.

Similar localities were found near the head-waters of the Opho stream.

With reference to the number of first class trees on the square mile, these forests are like those on the Thallaidan, and Shwootinga Choungs, but the proportion of second class trees is larger, and the number of third and fourth class trees is sufficient. The total number of first class trees may be about 1200 (200 on 6 square miles,) of which, if it should be required, 40 might annually be removed.

These forests have, it appears, been less extensively worked than those to the north, but it is remarkable that several instances of unauthorized felling of green Teak timber were lately found here, not



for sale, but with a view to build Zayats and Kyoungs. It appears doubtful whether the timber from these forests can be taken to the Irrawaddie river, or whether it must not go into the Bassein Creek (Nawoon Choung).

32.—The forests in the Bassein district are of very limited value. Yet

Forests in the Bassein District.

Teak trees, and some of these of good size are found, both on the west, and the

east side of the Nawoon Choung (Bassein Creek) to near the sea shore. The existence of Teak-producing tracts in the Delta of the Irrawaddie is owing to the high ground formed by long ridges of laterite, which are covered with forest altogether different in character from the mangrove jungle on the low ground of the Delta, or the low forests in the plains covered with elephant grass. On these tracts of high ground, isolated groups of teak Trees are found here and there, from Bassein to Syriam below Rangoon.

The Bassein Forests have not yet been surveyed, but a statement of the principal Teak-producing tracts, compiled from native information, was communicated to me in March 1858, by Major Brown, then Deputy Commissioner of the Bassein district, and from this statement, the following notes are extracted. They serve to give an idea of the comparative value of the different tracts, but can scarcely be held to afford information as to the actual amount of Teak standing in the different localities.

No. of living Teak trees in the townships west of the	
Nawoon Choung, .....	2641
Ditto east ditto ditto, .....	1294
<hr/>	
Total Bassein district, .....	3935

On the west side the greatest number of Teak is in the Quingouk township (1403 trees), this is the district contiguous to, and south of the Opho district; south of this is the Kyoukchoungelay district with 945 trees; next the Hpotan district with 125, and Yaygee district with 218 trees. On the east is the Tsabayoon district, with 310 trees, and further south, the Theekwong with 525, and lastly, in the heart of the Irrawaddie Delta, the Shwoeloun district with 115 trees.

33.—The Western Forests have as yet yielded but little timber.

Year.	Logs.	Tons.	Remarks.
1856-57	2629	617	
1857-58	2002	521	It is supposed that they still contain
1858-59	574	257	3600 seasoned trees.
1859-60	137	79	

Total,	5342	1474
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34.—The fourth division comprises the Southern Forests. These

Southern Forests.		forests were minutely examined by Dr. McClelland in 1854, and their general features have been described in his report on the Southern Forests, dated Prome, 5th April, 1854. I have had
Average No. of Teak trees on the square mile.		
First Class, .....	584	
Second ditto, .....	613	
Third ditto, .....	823	
Fourth ditto, .....	977	

the following opportunities of becoming acquainted with these forests. During the dry season of 1858, I superintended the work of girdling in the Hline Forest, and made several excursions across the hills to the Pounghlin Forests and the Pegu Forests, between Zountoo and the Kyouktagn. In April of the same year, I made an excursion from the Tharrawaddie Forests to the Upper Pegu valley, about 10 miles below its source. A portion of the Pounghlin and Hline Forests were also visited by my Deputy, Mr. Leeds, in March 1860.

The Southern Forests comprise the tracts along the southern tributaries of the Hline river, those in the valley of the Pounghlin Choung, and those along the Pegu or Zamayee river. The valley of the latter river is much longer than is generally supposed, its head waters are in the latitude of Akouktoun, on the Irrawaddie, about 120 miles due north of Rangoon. The range of hills which separates this long valley from that of the Sitang river and its tributaries, is only one of the numerous parallel branches thrown out by the Yomah range on its east side.

The upper part of the Zamayee or Pegu valley has more the character of a table land with hilly surface, intersected by deep ravines. The mean elevation of this tract may be about 1500', but the hills rising from it are not lower than the main ridges of the Yomah or about 2000' high. When ascending the steep sides of the Yomah, from the Irrawaddie valley, you expect a similar fall on the other side; instead of this you find a high hilly country and have to cross many ranges before descending into the plains of the Sitang valley on the East.

35.—The upper part of the Pegu valley contains no Teak. Much of the forest is dense evergreen forest, or forest in which evergreen trees are mixed with Pynkadoe and others which shed their leaves. Teak commences about 30 miles further south, and here are some of the richest Teak localities of the province, hitherto protected by the rocky pass

Zamayee or Pegu Forests.  
Amount of timber yielded during  
4 years.

Years.	Logs.	Tons.
1856-57	185	76
1857-58	804	671
1858-59	596	420
1859-60	679	492
Total,	2214	1659

of the Pegu river called the Kyouktaga (or gate of rock), which is about 64 miles north of Rangoon. The difficulty in floating timber through this gate of rock consists in a fall, a narrow winding passage 75 feet long, and 12' wide, and three detached rocks at the end of this passage in the bed of the river.

The rocks forming this gorge are sandstone. The strata here are dislocated, their direction is north-east to south-west, at right angles with the direction prevailing in the Pegu Yomah. The passage might be widened by blasting, but even without this, timber might be brought through, by being dragged along over the banks by the most difficult part. Teak, however, is abundant also on the hills below the Kyouktaga, the stems are of large girth, tall and regular, yet large trees are rather scattered. On the 22nd March, 1860, I counted along a march of 8 miles over the hills on the east side of the Zamayee valley from the Taïdo Choung to the Kyouktaga, 146 first class trees, which is at the rate of 876 trees per square mile. A similar result was obtained on the 23rd, when I counted 208 first class Teak trees on a march of 12 miles on the hills of the west side near the Kuaigo Choung, which is at the rate of 800 first class trees per square mile.

The proportion of the trees of the different classes is a favorable one. Out of 2925 trees counted in the Zamayee forests there were

First class, .....	455
Second class, .....	719
Third class, .....	980
Fourth class, .....	771

That part of the Zamayee forests which contains Teak, including the forests above the Kyouktaga, may be estimated at 40 miles long and 10 miles wide, or 400 square miles, of this area one-half may be con-

sidered as producing Teak, and this may, if we assume the number of first class trees observed throughout the Southern Forests to hold good here, contain about 116,800 first class trees.

36.—About 56 miles north of Rangoon, the Yomah range, which separates the Pegu valley from the Pounplin Forests. tributaries of the Meimakha in the Tharrawaddie Forest, sends out a spur to the south south-west, itself pursuing its south south-east direction. The western spur divides the waters of the Oakkan, Magayee, and Maubee Choungs, all tributaries of the Hline river, from the western feeders of the Pounplin stream, and after rising once more in the irregularly shaped limestone hills of the Tounyo town, terminates at last in the laterite hills around the Rangoon Pagoda.

The main spur continues in a south south-east direction dividing the valleys of the Pounplin and Pegu rivers, and terminates west of Pegu town. A few miles north of this point of bifurcation of the Yomah range is the Kambaloo town, one of the more elevated points of the southern Yomah, from the slopes of which, I had on the 6th May, 1858, an excellent view of the whole of the valleys to the south, east and west, revealing at a glance the geography of the greater part of the Southern Forests. The Pagoda of Pegu was distinctly visible in the clear atmosphere of May, to the south-east at a distance of about 35 miles, and a slight rise on the horizon to the south was pointed out as the hill of the Rangoon Pagoda.

The Pounplin Forests are situated in the wide but short valley, enclosed by the two branches of the Yomah range. The spurs of the hills encircling it are covered with excellent Teak, but the forests in the plains are nearly exhausted. A very rich forest on one of the central feeders of the Pounplin, the Wasoë Choung, is closed by a narrow gorge of rock, which will either have to be blasted or stopped, in order to raise the water above, and to render the floating of timber practicable.

The area of the Teak localities in the Pounplin valley may be estimated at 40 square miles with 22,600 first class trees growing on the same.

The Pounplin Forests have yielded, since the working of the forests on Government account commenced,

Years.	Logs.	Tons.
1856-57	716	414
1857-58	1032	667
1858-59	282	184
1859-60	232	168
Total,	2262	1433

37.—The Teak-producing tracts on the south tributaries of the Hline river, are contiguous to the Hline Forests. Tharrawaddie Forests.

In the Thounzay and Oakkan, Teak localities cover a considerable proportion of the area, and the finest localities are on the hills. In the Magayee and Mayzelee district, the Teak-producing tracts are more scattered, and some of the best are to be found on level or slightly undulated ground.

Some of the Teak localities in the Thounzay Forests are among the best in Pegu. On the 29th February I examined the forests along the Thounzay Kodogway. On a march of 10 miles, I counted 279 first class trees, all of excellent growth, being at the rate of 900 trees per square mile. On the 6th May I counted, on a march of five miles through the Thabjoo Forests, 390 first class trees, most of them with tall, clear, and regular stems. This is at the rate of 2100 first class trees per square mile. On the 4th May, I counted in the Namapouk Forests, on a length of 10 miles, 162 first class trees, of which 68 were in girth between 7' 6" and 9', and 22 above 9 feet. Near the head waters of the Oakkan the following trees were counted on the 10th May.

Girth of 6' to 7' 6", .....	134
ditto 7' 6" to 9', .....	88
ditto above 9', .....	40
Total first class trees,.....	262

The best Teak localities on the Magayee Choung do not exceed 400 first class trees on the square mile. Yet this stream has been but little worked, owing to the circumstance that its bed is so overgrown with trees and brushwood that the floating of timber is a difficult operation.

The area covered with Teak-producing forest in the Hline district is estimated at 115.6 square miles which, at the rate of 584 first class

trees, would give 67,510. This figure is also borne out by the results of the girdling operations in that district in 1858.

The operations that year were conducted in one-third of the Southern Forests. Instead therefore of girdling one-fourth of the first class trees, three-fourths were girdled, and these were selected from the trees of 7' and upwards in girth.

The number of trees girdled was 44,272, and hence the number of first class trees, before the girdling operations were commenced, may be supposed to have been 59,029.

The proportion of trees girdled and those remaining, has also been determined in a more direct manner. It is customary, when inspecting the trees girdled in the forests, to count at the same time the number of trees of the different classes not girdled, and standing on the same area with those girdled.

These surveys have been carried on in the Southern Forests, whenever such was practicable.

The result has been No. of trees		
girdled in girth above 7', ....	13,062	} Total of first and second class 36,050.
Ditto ditto between, 7' 6" & 7'...	22,988	
Ditto ditto ditto, 1' 6" & 4' 6"...	31,010	Third class.
Small trees, .....	47,836	Fourth class.

The number of first and second class trees being about equal in the Southern Forests, we have, for determining the probable number of first class trees standing on those localities where girdling operations were conducted, the proportion

$$13062 : 44272 = 18025 : 61080.$$

No trees were girdled where Teak occurs only scattered, and in many districts in the hills no girdling operations were conducted. This explains the difference between the two figures obtained.

No girdling operations will be carried on in the Hline forests for the next 18 years, the annual outturn therefore is—

$\frac{44272}{18} = 2459$  Trees. The Hline forests have yielded in timber

Year.	Logs.	Tons.
1856-57	2391	1327
1857-58	822	560
1858-59	757	497
1859-60	421	296
Total.	4391	2680

38.—For the whole of the Southern Forests we have estimated

Southern forests, area and Teak area of the Teak-producing forest on the same. 355.6 square miles, and estimated number of first class Teak trees 205,800. The number of second class trees is about equal to that of the first: a rotation of 40 years therefore is ample, giving an annual outturn of 5,120 trees, or, if the girdling operations are conducted once in six years, 30,720 trees. The girdling in 1858 was in excess, owing to the adoption of a rotation of 24 + 62 years instead of one of 40 + 62 years, as now proposed.

But many years must elapse before the whole, or even one-half of this annual supply can regularly be brought to market. Girdling and felling the trees is one thing, and bringing them down is another, and a far more difficult operation.

39.—*The fifth and sixth divisions of the Pegu forests comprise the forests in the Siting valley.*

Western Sitang Forests.

The Western Sitang forests have been fully described in Dr. McClelland's report of 1855. A portion of the same, viz. the Bonee, Koon, Hpyoo, and Khaboung Forests were examined by me in 1856, but no regular forest survey has as yet been made, nor have any girdling operations been carried on in them which might enable us to form an estimate of the probable number of first class trees available for working.

The total area of this division, irrespective of Teak localities, that is, the space between the Sitang river and the water-shed of the Yomah to the west, is about 4000 square miles. About one-half of this may be said to be level ground or low undulating hills. The greater part of the plains is covered with wide extents of elephant grass interspersed with Seet (*Abizzia elata*), Lapan (*Bombax Malabaricum*), Baup (*Butea frondosa*), Teinthey (*Nauclea parviflora*), and a few other kinds. A small fraction is cultivated as wet paddy land or occupied by Youngya clearings. A considerable portion is covered with Dipterocarpus or Ein forest, which forms a belt in the northern part of the division between the low ground and the hills; and another with mixed forest consisting of Bambouay (*Careya arborea*), Yindike (*Dalbergia* sp.), Zimbjoon (*Dillenia aurea*), Aukchinza (*Diospyros*, sp.), Myoukshow (*Blackwellia*, sp.), Pynmah (*Lagerstromia Regina*), Nagyiben (*Pterospermum sagittatum*), with Pynkadoe (*Inga xylocarpa*), and Toukkyan (*Pentaptera macrocarpa*). In this forest, the trees of

which attain a magnificent size in the light but rich alluvial soil which is peculiar to some parts of the Sitang valley, Teak-producing tracts of limited extent but great value occur here and there, similar to those in the lower Tharawaddio forests, but the trees are larger and of better growth.

The hills cover a far wider area than those on the west side of the water-shed; hence the principal streams which drain this side have running water throughout the year. Their valleys are frequently longitudinal, parallel with the general line of elevation, running for considerable lengths from north west to south east. The valleys on the west side likewise frequently maintain a longitudinal direction, yet they are much shorter; and this may be considered as the main reason why many of the streams running through them dry up soon after the close of the rains.

The forest on the hills has a different character in the southern part from what is seen to the north. To the south nearer the sea and more under the influence of the S. W. monsoon the slopes of the hills are covered to a great extent with dense evergreen forests and bamboo jungle. No Teak is found here. Towards the north the moist shady forests and the bamboo jungle gradually decrease. Near the Hpyoo and Khaboung streams, they are found only on the top of the hills and in deep dells, or on those slopes of the valley which have a northerly aspect.

When marching up a valley with high sides, for instance that of the Hpyoo Choung, the difference in the vegetation which clothes the two sides, changing from one to the other at every winding of the stream, is remarkable. One side is generally seen covered with dense green forest of the large leaved climbing bamboo, with Thingan (*Hopea odorata*), Kanyin (*Dipterocarpus alata*), Oak (*Quercus semiserrata*), and others; and the other with dry open forest of Pynkadoo, Myoukshow, Guayben, with Teak. Sometimes the stratification of the rock contributes to make the difference more marked, the slope where the heads of the strata protrude being generally more fertile and moist than that where the beds lie parallel with the side of the hill. It is a remarkable fact that Teak thrives well on the sides of the hills where the surface of the inclined sandstone strata is covered with only a few inches of soil, which often is washed away by the torrents of the south west monsoon. The horizontal roots of Teak which run almost parallel with the surface, have a peculiar facility for entering the fissures of the



rock and finding support and nourishment where trees of deeper growing roots would not thrive.

When crossing the Yomah range from Prome to Toungoo, via the Khaboung pass, Teak-producing tracts are met with along the whole route, whereas when crossing it fifty miles further south, a considerable part of the road leads through forests without a trace of Teak.

40.—Of the Western Sitang forests, those near the frontier on the Western Sitang Forests near the Swah, Myolah, and Dounklangya Frontiers, streams, are the most valuable. Here a large proportion of the Teak localities is on level ground, the removal of the timber is comparatively easy, and the forests, though worked to a certain extent, still contain an abundance of magnificent timber.

Khaboung Forests. 41.—The Khaboung forests have excellent trees on the hills, but the forests on the plains are limited.

42. The Hpyoo and Koon forests have a considerable quantity of timber both in the plains and in the hills, but the forests in the plains have been much worked out, and those in the hills are at present sealed-up treasures until the obstructions existing near the villages of Minlan and Jobew shall have been removed. I examined these obstructions minutely in February 1858. They consist of rapids and narrow passages between rocks, extending over several miles, and to open them by blasting would be an extremely difficult and expensive operation.

Hpyoo and Koon Forests. 43.—The forests in the Bonee district are mostly in the plains, and consist of isolated patches of limited extent, but contain some timber of great value. The obstructions which have hitherto prevented the working of these forests are of little importance: they consist only of irregularities in the bed, which spreads out into numerous channels or is narrowed by the encroachment of trees and bushes.

44.—We are not justified in supposing the area covered with Teak localities in the Western Sitang forests and the number of trees in the same to be greater than that of the Eastern Prome or Southern Forests,

that is, about 300 square miles with 200,000 first class trees, which, if an average rotation of 102 years is observed, may be expected to give 5000 tons annually. This estimate does not include the hill forests of the Koon and Hpyoo Choung, as they are not likely to be opened out at present.

The yield of old seasoned timber from these forests by the contract system has been—

1856-57	2396	Logs, or tons	1456
1857-58	1813	„ „	1815
1858-59	1865	„ „	1361
1859-60	1299	„ „	1094
<hr/>			<hr/>
Total,	7378	Logs, or tons	5726

45.—Inhabitants in these forest districts are scarce. Burmans inhabit the plains, and Karens and Yalines (Burmans who cultivate mulberry and cotton) are settled in the hills. Very little assistance can be expected from the natives of the place in the working of their forests.

46.—The Eastern Sitang forests are situated between the Sitang river and the foot of the mountain ranges between this and the Salween.

Eastern Sitang Forests.

I purposely name the foot of these mountains as the limit; for Teak, though ascending in some localities as high as 3000 feet, will not, as a rule, be available from such localities for the market.

The Teak localities which are of importance as resources of timber are situated at the bottom of valleys of the larger tributaries of the Sitang river and on the lower part of the hills skirting these valleys.

The Eastern Sitang forests between the Youkthawah stream and the frontier were visited by Dr. McClelland in 1855. In 1856 I examined the Youkthawah and Thowkyaghat forests, and in 1857, a survey connected with the girdling operations was conducted by the Superintendent and his assistant, Mr. E. Clemen, extending from the Padah to the Koonoong forests. In March 1860, the Kannee, Koonoong, and Gwaythay forests were examined by Mr. McDonald, then Assistant Superintendent of the Sitang forests. Extracts of his journal are given in Appendix No. 1.

47.—The Teak forests below the Padah Choung, which is in the same latitude with the Koon Choung, are of very limited importance. Groups of Teak trees are found scattered all along the road leading from Sitang to Shwaygyeen and thence to Kyoukee, but the stems are of irregular shapes and seldom very tall.

Further inland, higher up the valleys of the following streams—

Kyoonpago,  
Thambyah Choung,  
Maywino,  
Shoaygyeen Choung,  
Bogota Choung,

Kyoukee or Shwoelantoun Choung, considerable quantities of Teak are said to grow, but only a small proportion of full-sized trees of regular shape.

48.—The Padah and Moong Forests are the first of any importance. The Padah stream is the source of the Kyoukee river, a short parallel stream to the Sitang river, joined to it in the rains, both above and below. The Moong stream empties itself into the Sitang river. Both streams rise in the high ranges of hills dividing the Yoonzaleen and Sitang valleys, and have running water throughout the year, sufficient to float bamboo and small timber.

Teak here forms excellent forests on level ground along the banks of the main stream, and a good proportion of Teak trees is found on the lower hills immediately skirting the valley. Some of the forests are on deep and rich alluvial soil, others on higher, slightly undulated ground, densely covered with a species of Pollinia which, if not yet described, ought to be called Teak grass, "*Pollinia Tectonca*," as it is quite characteristic of a peculiar class of Teak localities, designated

Attaran Report, para. 13.

in the Attaran Report as the *second group*. It is a soft grass with long narrow blades, often from six to eight feet high, so that when penetrating a forest covered with it during the rains, you are deeply immersed in it. Yet it offers no serious impediment to progress through a forest, as elephant grass decidedly does; which, however, is not found in Teak localities. The Teak grass is not very favorable to the

Padah and Moong Forests.	
Number of Teak trees estimated to stand on one square mile.	
First class, .....	2172
Second class, .....	1483
Third class, .....	1535
Fourth class, .....	1618

springing up of seedlings. It springs up rapidly in May, when the seedlings are young and easily choked, after January and February it subsides into a densely interwoven mass of dry, easily inflammable, matter, and renders jungle fires more destructive than they otherwise would be, and thus causes the destruction of numerous seedlings.

Indeed the Moong and Padah Forests, where this grass is frequent, are remarkably poor in seedlings. With 3441 first class trees counted in these forests, only 2287 fourth class trees or seedlings were found. But the want of seedlings in some instances must be ascribed to other causes. On the 10th January I counted in the forests on the hills south of the Moong Choung, called Pocheekotoun, on an area of 51 acres,

First class trees, .....	294
Second ditto ditto, .....	62
Third ditto ditto, .....	63

but only six seedlings.

This forest is not covered with Teak grass. It belongs to what has been designated as the *fourth group*. Teak is associated here with

Attaran Report, para. 13.	dense shady bamboo jungle, mostly consisting of Kyathounwa ( <i>bambusa arundinacea</i> ), which affords an opening for the springing up of seedlings only when the bamboo dies after seeding.
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Throughout the Teak-producing tracts of the Moong and Padah forests, the number of first class trees is greater than that of the second, and occasionally more than double. Trees of large girth are frequent. Out of 3441 first class trees counted in these forests there were—

Above 9 feet in girth, .....	839
„ 7½ „ „ .....	920
„ 6 „ „ .....	1682

Total, ..... 3441

first class trees. And among the 294 first class trees counted on the Pocheekotoun not less than 124 had a girth exceeding 9 feet and 100 were 7 feet 6 inches in girth and above. This high proportion of large-sized trees is also borne out by the results of the girdling operations. In the season 1859 only trees in girth above 8 feet 3 inches were selected for girdling. The area of the Teak localities in the

Moong and Padah forests is estimated at 16 square miles; on this area were girdled

Padah,.....	3497
Moong, .....	2331

—————  
Total, ..... 5828 trees, in girth above 8 feet 3 inches, which is at the rate of 361 trees per square mile; the average number of first class trees per square mile, being six times greater, or 2472. The proportion of 839 to 3411 is as 1 to 4, but only a portion of the trees of 8 feet 3 inches in girth were girdled, many were left standing, because they were either useless, or the character of the forest did not admit of girdling one-sixth part of the first class trees.

The Padah and Moong forests have not been worked to any great extent. This is borne out both by the prevalence of the large-sized trees and by the comparative paucity of stumps, many of which have their origin not in the working of the forests but in Tounghya cultivation.

The number of first class Teak trees standing in these forests may be estimated at 39,552. If one-sixtieth of these is girdled annually, or one-tenth once in six years, the number that may be girdled is 3955 once every six years. In 1859 the number girdled was 5828, thus the girdling operations have been somewhat in excess. It is hoped that this will promote the springing up of seedlings, but hereafter this number will have to be less.

The forests are much infested with creepers. It is customary for the coolies who girdle the trees to cut away all creepers on Teak trees within sight. In 1859, 2972 creepers were cut in the Moong and Padah forests.

The inhabitants of the forests are Karens. There are numerous villages in the hills beyond the Teak forests where the betel palm is cultivated extensively. The Moong and Padah forests have not yielded any timber since they were united with the Pegu forest group. Yet there is a considerable amount of seasoned timber remaining in the same.

During the operation of girdling, 283 logs found lying in the forests, in girth above 6 feet, and 70 logs, in girth below 6 feet, were lopped, the branches and roots being cut off, so as to ensure their better protection from fires.

49.—The Youkthawah and Thoukyaghat extend over a much

Youkthawah and Thoukyaghat Forests.

Number of trees estimated to stand on one square mile.

First class, ..... 1501

Second class, ..... 633

Third class, ..... 1417

Fourth class, ..... 1777

greater area, but have few Teak-producing tracts, that in number of trees can be compared with those of the Moong and Padah forests. They have been worked to a very great extent. The Youkthawah is a stream of about

the size of the Moong Chong, but has several large tributary streams joining it in the plains, the area drained by it spreads out more, and offers a greater space for Teak localities. The best tracts, as far as straight clear stems are concerned, are on even alluvial ground along the main river with an abundance of seedlings and trees of the smaller classes.

Isolated groups of low hills with rounded outlines composed of granite, and more continuous elevated ground composed of laterite, divide the different branches of the stream. Some of these hills are covered with *Dipterocarpus* (Ein) forest, others with dry bamboo forest, and in this are found some of the largest trees. Girths of from 8 to 15 feet are not uncommon. But upon the whole the growth of these trees is neither straight nor regular. They have moreover suffered much from former Toungya clearings, we have here forked and irregularly branching trees, pollards and staveus, in the same manner as in the Western Irrawaddie Forests.

The two forest surveys of the Youkthawah district, recorded in No. IV. of the extracts from the forest day-books,\* give only an

incomplete idea of the Youkthawah

Forests. On the 24th January, 1859, I went through the Bimbyay Forests along the course of the Youkthawah stream. Out of 129 first class trees observed, twenty were above 9 feet in girth, and thirty-three between  $7\frac{1}{2}$  feet and 9 feet. One tree of 18 feet girth, and another of 13 feet, were measured. At the same time only 56 trees of the second, and 9 of the third class were observed.

But on the 25th March, 1856, I counted on the granite (and trapp) hills east of Bombadec, 60 trees of the first and second class, and no less than 510 of the third.

In every forest district there is naturally a certain variety of the different tracts, but this instance may serve to show, that it is not safe to form an idea of the general character of a forest from merely

a few isolated surveys. The trees associated with Teak in the Youkthawah forests are similar to those of forests similarly situated in the Irrawaddie valley, but with a few distinctive marks which deserve to be noted, as they are not peculiar to the Youkthawah forests alone, but are common to all tracts, east of the Sitang river; Pymmahbew (*Lagerströma cuspidata*, Wall.), a remarkable tree with tall white stems, is found here. Padouk (*Pterocarpus Dalbergioides*) occurs in considerable numbers and attains great girth. On the 22nd January three magnificent trees of this kind were girdled in the Metindah forest of the following dimensions.

Length of stem to first branch 40' girth 10' 2"

" " " 40' " 14' 2"

" " " 36' " 11' 6"

50.—The Thoukyaghat forests extend over a very great space.

Teak localities drained by the feeders  
of the Thoukyaghat stream.

The area drained by this river, and  
which may be estimated at about 1000

square miles, is not quite as large as that drained by the Matoong Choung in the Western Irrawaddie Forests. But the Thoukyaghat river has more water than the Matoong: its feeders rise from mountain ranges with an average elevation of 4000, and in some places of 7000 feet. The Thoukyaghat itself comes from the north; but, before leaving the hills, about 20 miles east of Toungoo, turns to the west and pursues this direction until it joins the Sitang river. Between its upper course and the Sitang river is enclosed a mountain land, in width nearly 20 miles and rising to an elevation of 4000 feet.

At or above this bend to the west the river receives two large tributary streams from the south-east; the Kyay Choung and the Myitgnan; and where the Thoukyaghat emerges from the hills, it takes in a third, the Choungmagnay, from the same direction.

On the whole of the high hills drained by the Thoukyaghat river, Teak has at one time been very extensively spread. But the extensive Toungya clearings of the Karens on these hills have entirely changed the aspect of the country. Wherever the gradient admits of hill clearings the slopes and ridges are covered with grass jungle composed of certain species of *sacharum* and other grasses, some of them identical with the kinds constituting the elephant grass of the plains, but not attaining here an height exceeding 5 feet. From these wide extents of grass land stand out isolated Teak trees, with short,

gnarled, often forked stems and bushy heads. Only wherever the slopes of the hills are too steep for Toungya cultivation, that is where the gradient exceeds  $30^{\circ}$ , the original forest is preserved and here Teak is frequently found forming a considerable proportion of the forest.

The trees of other kinds here associated with Teak are not altogether the same as those on the lower hills. Pynkadoe is frequent, but with it are found in larger proportions than usual, Chinjookben (*Garuga pinnata*), Theyah (*Shorea obtusa*, Wall.), Tounkalamet (*Cordia*, sp.), Yemenchbin (*Gmelina arborea*). Teak on these hills occasionally attains a considerable size. On the 21st May I found near the Kyay Choung, on a very steep slope with an average gradient of  $40^{\circ}$ , a considerable number of fine Teak trees with clear stems above 50 feet high, and from seven to nine feet in girth. On the 21st and 23rd May I counted along the path leading from Oubo village to Payllowa beyond Bogeley, the distance being about 20 miles, first class trees not materially injured by hill clearings, 54; of these 12 in girth above 9 feet; trees mutilated, forked or otherwise injured, by Toungya cultivation, 443. Yet this is a part where cultivation has spread less than in other side valleys of the Thonkyaghat. In the Myitgnan valley I counted on two marches, on the 10th and 11th February, .

Trees of the first class, ..... 152

„ Second and third classes, ..... 130. Of these six trees only has stems that might be expected to yield marketable timber, the remainder were all mutilated, forked, or otherwise useless.

At the same time a good number of seedlings constantly spring up. On the same routes I observed in the Myitgnan valley 107 and in the Kyay Choung 201 seedlings. So that, should ever cultivation cease in these regions, the forests would show a rapid improvement.

But the value of Teak in these localities for commercial purposes is very limited. The beds of the rivers are mostly so rocky and irregular and the slopes of the valleys so broken, that the bringing away of the timber in large quantities to the Thoukyaghat river, would be a most difficult and expensive operation. Indeed, in many localities the timber may be said to be altogether unavailable. And on the other hand, if the preservation of the Teak were insisted on in these localities, where for ages past it has served for purposes of cultivation, it is doubtful whether the Karen population, at present inhabiting those mountains, would continue to find the means of exist-



ence. Indeed it is probable that the first attempt at enforcing the observance of the forest rules, would be the signal for universal emigration.

This was an instance calling for the exercise of the authority vested in the Officers of the Forest Department by Rule VI. (new rules), and it has already been noticed in the Forest Report for 1858-59, para. 8, that the Karen inhabitants of these mountains have been permitted to carry on their hill clearings without reference to Teak, in localities where the timber cannot be made available for the market. But if they wish to cut timber and use it for the erection of buildings or other purposes, they cannot do so without special license.

51.—We now proceed to the Teak localities in the plains and lower hills. They cover the low undulated hills along both sides of the Thoukyaghat river, Teak being generally found in evergreen bamboo forest of *Kyathounwa* (*Bambusa arundinacea*), and frequently attaining an enormous size. But between the Teak-producing tracts wide extents of *Ein* (*Dipterocarpus*) forests are interspersed, and higher up the river, tracts of evergreen forests commence, with *Thingan* (*Hopea*) *Quercus*, a variety of other trees, rattans and a large kind of bamboo (*Kyellowwa*) nearly related to *Bambusa gigantea*: granite alternates with laterite, and higher up limestone is found. Teak trees of large girth are common in this forest. They have been left standing, while those of more moderate size have been removed.

On the 1st February, 1859, in the Kyouk O Forest on the south side of the river 265 trees of the first class were observed, of these 166 were in girth above 9 feet.

The stems of trees growing on laterite are not very tall and straight, the stature of those growing between the granite of boulders is somewhat better, but the finest trees are to be found higher up the valley, where limestone is mixed with granite. Here several stems 100 feet high were observed, perfectly sound and regular. In nearly all the Thoukyaghat forests the number of first class trees is greater than that of the second. But the number of third and fourth class trees is considerable, so that if the expenditure of first and second class trees is so managed that it lasts until the third class trees shall have attained the size of first class trees, the preservation of the forest is secured.

The trees associated with Teak in the Thoukyaghat forests are to a great extent the same as those mentioned on the Youkthawah district. It is worthy of note that the Cordia with fragrant wood, attains a girth of 6 feet in this forest. Kyoonboo Kyoonnalin (*Premna pyramidata*) is very frequent.

On account of its proximity to Toungoo, the Thoukyaghat Forest appears particularly well adapted for carrying out the plans of consolidating the forests. The plan is discussed in para. 182 of my first report on the Pegu forests, and the then assistant at Toungoo the late Mr. DeRenzy undertook, in 1856, with a view towards carrying out this plan, a careful examination of the forests, but his lamented death put a stop to this work, and the constant change of officers in successive charge of the Sitang forests has rendered further steps impossible.

The Thoukyaghat and Youkthawah forests are estimated to have 24 square miles covered with Teak-producing tracts whence timber can be made available. These are estimated to bear 51,136 first class trees.

These may be worked in a rotation of  $60 + 62 = 122$  years and may be expected to yield annually 852 first class trees.

The number of trees girdled in the same in 1859 was

Youkthawah, .....	857
Thoukyaghat, .....	1043
	<hr/>
Total, .....	1900
	<hr/>

If the above estimate is correct, 5113 might have been girdled. The number of creepers was 1209. The yield of the Thoukyaghat and Youkthawah forests in old seasoned timber has been,

Years.	Logs.	Tons,
1856-57	2300	1805
1857-58	0	0
1858-59	2399	2060
1859-60	0	0
	<hr/>	<hr/>
Total,	4699	3865
	<hr/>	<hr/>

52.—The remaining forests of the sixth division are the Kannee, Koonoong, Gwaythay and Bimbyay

Kannee and Koonoong Forests.

Number of Teak trees estimated to stand on one square mile.	
First class, .....	5054
Second class, .....	2208
Third class, .....	6691
Fourth class, .....	14468

Forests. The west side of the hills mentioned above as separating the Sitang and Thoukyaghat streams is drained by a number of tributaries of the Sitang river of which

the abovenamed are the most important. Along these streams and on the hills near them are some of the richest Teak localities in the province. Teak is found on rocky hills and on light brown mould. On the latter soil the trees attain the greatest height and the most regular growth. Mr. MacDonald mentions one locality one mile south of the Gwaythay Choung with groups of trees of the finest growth that might be cut into logs of 100 to 120 feet in length, quite round and straight. In most localities these forests abound in seedlings, and the ground is described as free from under-wood. The principal enemy of the Teak here is the jungle fire annually recurring.

The survey of the Kannee and Koonoong forests by Mr. Clemen in 1859 gives 5054 first class trees as the average figure per square mile. But tracts of limited extent have a much higher figure. Thus on the 26th April, 1859, he found in the Nat Yat forest on the south side of the Koonoong Choung, on an area of 73 acres, 508 first class trees, of which 213 were in girth above 9 feet. And on the 9th April he found a forest on the Kannee Choung between the Kannee and Koonoong with 2621 first class trees on an area of one-third square mile, 1217 of which were above 9 feet in girth. This is at the rate of 7100 trees per square mile.

The prospects for the future development of these forests are very favorable. Forests, naturally very rich and not much worked, must be expected to have an excess of old trees. The number of second class trees is less than that of the first, but the number of third class trees is considerably larger, and the number of seedlings counted is three times as large. A term of sixty years is more than sufficient to allow the second and third class trees to take the place of those of the first. Indeed, if this rotation is observed, the forest must, although annually yielding a considerable amount of fine timber, go on increasing instead of having its resources diminished. The area covered with Teak in the Kannee and Koonoong forests is estimated

at 24 square miles. This would give the figure of first class trees at 121,296, and the number of trees that may be removed once in six years at 12,129.

The number girdled in 1859 was not fully one half of this number.

Kannee, .....	3667
Koonoong, .....	2364
Total, .....	6031

But the girdling operations were only carried on in a part of these forests. Creepers are frequent in the Kannee and Koonoong forests: 5388 Teak trees were freed from them in the districts under Mr. Clemen's supervision in 1859 :—

The timber brought down from these forests on Government account has been as follows.

Years.	Logs.	Tons.
1856-57	3360	2396
1857-58	446	382
1858-59	31	21
1859-60	0	0
Total,	3837	2799

But a very large amount of valuable old seasoned timber still remains in these forests. The number of trees and pieces is estimated at 3300. There is therefore abundance of work in these forests for contractors or permit holders. Foresters from abroad have been somewhat disinclined to engage in working these forests on account of the risk of losing their elephants by marauding parties coming across the northern frontier, or by the wild Karen tribes, coming down from the hills to the east.

The inhabitants of these forests are mostly Karens, some of them have elephants and have for a number of years past been engaged in working the forests. The whole of the Eastern Sitang Forests including those south of the Padah Forests, may be estimated as containing 100 square miles covered with Teak localities, containing 240,000 first class trees, which may be expected to yield about 4000 trees per annum.

53.—The six divisions of the Pegu Forests, as far as their value

General review of the six divisions for the yield of timber, and the size, of the Pegu Forests. regular shape and facilities for re-

moval of the same, is concerned, may be arranged in the following order.

	Area of Teak Localities.	Number of trees estimated to stand on the whole of forests.	Proportion of trees to be removed annually.	Number of trees to be girdled annually.	Number of tons removed during the last 4 years from 1856-57 to 1859-60.	Average size of the logs in cubic feet.
	Sq. Miles.					
Tharrawaddie Forests,.....	580	5,75,360	$\frac{1}{8}$	9706	13604	36
Western Sitang Forests, ...	300	2,00,000	$\frac{1}{8}$	5000	5726	25
Eastern Sitang Forests, ...	100	2,40,000	$\frac{1}{8}$	4000	9191	39
Eastern Prome Forests, ...	320	2,50,000	$\frac{1}{8}$	5000	2632	17
Southern Forests,.....	355.6	2,05,800	$\frac{1}{8}$	5120	5772	33
Western Forests, .....	200	60,000	$\frac{1}{8}$	1200	1474	14
Total,	1855.6	15,31,160	-	30026	38722	

This arrangement is the result of a general estimate of all peculiarities of each forest division.

54.—The amount of timber brought down during the year under

Amount of timber brought down from the forests. review from the Pegu forests on account of Government has been less

than in any of the foregoing years. Statement III. exhibits the amount of timber (and its cubical contents) brought from the different forests by forest contractors since 1856-57. This statement shows a steady decrease; in a less degree, however, in the number of tons than in the number of logs.

What have been the causes of this decrease?

55.—The main cause has been that our operations have necessarily

Seasoned timber getting scarce in the forests. been limited to the removal of old seasoned timber only, (Nathat, or

girdled during the Burmese time,) and that this, after having yielded considerable supplies ever since the occupation of the country, is gradually becoming scarce in the forests, or at least in such parts of the

same, as can easily be worked. In my report for 1858-59, it was explained that it had been found advisable, in order to ensure the bringing down of thoroughly seasoned timber from the Government forests in Pegu, to postpone for another year the cutting and bringing down of the now girdled trees.

This sacrifice of revenue and apparent success was deliberately made, although the possibility was evident that its consequences might be made available for hastening on the overthrow of the present system of forest management.

Yet the timber from the Pegu forests is neither sufficiently plentiful nor so large or well-shaped, as that we can afford to lose the only advantage it at present possesses, viz. that of being more thoroughly seasoned than the timber brought down from the forests beyond the frontier. It was not one of the smallest disadvantages of the abandonment of the Attaran forests to impatient timber speculators, that a large proportion of the timber was cut green and used in ships built at Moulmain at that time in a state not sufficiently seasoned, and the greater part of the trees from the Siamese and Karenee forests are scarcely allowed to stand two years, only just long enough to enable them to float.

But this has not been the only cause for the falling off of the supply.

56.—There is still an abundance of old seasoned timber remaining

Amount of old seasoned timber in all parts of the forests. I myself still remaining. know hundreds of fine trees, standing and felled, Nathat or girdled during the Burman times, and a considerable number of valuable pieces, round logs, squares and planks, lying about in the forests of the Prome, Tharrawaddie and Southern District, and indeed in all the forest tracts I have visited. In surveying the western forests in 1860, the following timber available for removal was counted by Mr. Clemen :—

Nathat trees, .....	1302
Fallen,.....	881
Girdled first class, .....	33
Good logs, full-sized,.....	10
Ditto under-sized, .....	19

---

Total,... 2245 pieces.

It has been mentioned above that in the Padah and Mong forests, 353 logs were lopped and prepared for dragging in 1859. These were only a few of the best timbers lying in that forest, and the removal of this timber is not difficult in the least, the forests are situated in the plains along a large stream fit for floating. Moreover we have the evidence of Mr. MacDonald, who met with large numbers of excellent

See extract of Journal attached hereto. Appendix No. 1. timber of good size left close to the waterway in the Kannee, Koonoong and Gwaythay forests.

The total amount of old seasoned timber remaining in the forests in November 1859, was estimated at 40,670 logs, quite sufficient to have ensured a satisfactory supply during the last season, if the forest contractors had had the means, and had not found other occupations more profitable.

57.—It has already been mentioned in former reports that the purchase by the Commissariat Department of a large number of elephants during 1857-58, for export to India from Rangoon, has had the effect of disorganizing most of the arrangements previously made for an effective working of the forests. Numerous foresters, tempted by the high prices offered, sold the whole of their elephants and abandoned their former occupation, and the effects of this sudden interruption have not yet been effaced.

At the same time the demand for timber at Moulmain was very great, and it was difficult to induce foresters from that side to leave their settled employment in the forests beyond the British frontier for the purpose of settling in Pegu.

58.—And there were other circumstances besides those already mentioned, which combined to decrease the supply of timber from the forests, and not the least important was the difficulty experienced in providing for an efficient administration of those forests which cannot be managed from Head Quarters, but are placed under the control of assistants in outstations.

It is interesting to compare the supply of timber from the different divisions. The data are given in Statement III. The Tharrawaddie forests have yielded the greatest supply, more than one-third of the whole. Next follow the Eastern Sitang forests, which have yielded

one-fourth, and the remaining  $\frac{3}{4}$ th have been brought from the four remaining divisions. The Southern Forests have yielded 5772 tons, whereas the proceeds of the Prome Forests have only been 2652 tons. Yet the latter contained more seasoned timber than the former.

The supply from the Tharrawaddie forest has not considerably diminished since the beginning. On the other hand, the work of the Prome and East Sitang forests has, during the last year 1859-60, almost come to a stand still. The cause of this must not be sought in the want of seasoned timber, of which an abundant supply is left in both divisions: it may perhaps, to a certain degree, be ascribed to the circumstance that the Southern and Tharrawaddie Forests are under the immediate control of the Rangoon office, whereas the two other divisions are beyond its reach. But another circumstance has probably operated still more effectually. In 1857, the plan was conceived gradually to simplify the work of the Department by inducing all contractors to deliver their timber at Rangoon. This measure has been carried out with perfect success. In 1859-60, 8066 logs out of 8831 were delivered at Rangoon. But the plan, although a desirable one in 1857, when the number of elephants imported for the timber work was steadily increasing, and it appeared easy to secure the services of efficient forest contractors with ample means for working the forests, has proved premature and even dangerous. One disadvantage arising out of this plan of concentrating the whole of the timber at Rangoon, has been noticed in the report for 1858-59, (para. 5,) that it facilitates the swindling of contractors and the non-payment of the men employed by them. Another drawback has been experienced this year, viz. that it serves to decrease the amount of timber brought away from the forests. There are not many among the class of people, that usually engage in forest work, who are capable of managing a series of operations of such extent as the cutting, dragging, and floating down to Rangoon demand. Many who would be well able to bring their timber to a station near their forest are thus excluded from engaging on the work. It would have been wiser to have continued to keep distinct the cutting and dragging and the work of floating, and although this would have increased the timber expenses, the general result would have been more favorable, as the number of logs would have been greater. The golden rule, "*divide et impera*," has not here been sufficiently maintained.



59.—The size of the logs brought from the forests has somewhat improved, but not as much as might have been expected. If we could take a correct inventory of the old seasoned timber left behind by the contractors throughout the forests, we should find that of the small and moderately sized logs, a larger proportion had been removed, but that the timber of large sizes has, to a great extent, been left behind.

If this state of things cannot be altered, and if the contractors cannot be induced to remove the larger sizes in preference to the smaller logs, then the present system of working the forests must be given up. The contract rates for the larger sized timber are proportionately higher, but this does not seem to afford sufficient inducement, as long as the smaller sizes afford employment of an easier nature.

60.—The expenses incurred for the timber brought down in 1859-60, have been greater than in any of the previous years. The expenditure that must be charged on the timber is of those classes.

Contract Rates, ... ..	7	7	2	1. Rates paid to forest con-
General timber expenses, .....	3	8	10	tractors (for cutting, dragging,
Establishment, contingencies, &c.,	8	10	7	floating.)
Total,	19	10	7	2. General timber expenses,
				(floating, securing, watching, elephants, tools, stores, &c.)

### 3. Establishment and contingencies.

The rates paid to contractors and general timber expenses have been steadily rising since the commencement. They were—

	In 1856-57	5	0	0	per log of 30	5	cubic ft.
Compare Statement	1857-58	7	1	0	„	29	3 „
V. and Report for	1858-59	8	8	0	„	38	„
1858-59, para. 6.	1859-60	11	0	0	„	37	25 „

They have thus doubled, while the cubical contents of the log have only increased from 30 to 37 cubic feet. This is decidedly unfavorable; but it is not fair to compare the rates of the first year of our operations with those paid during the present. In 1856-57, a large proportion of the timber was lying in or close to the water-way; and was brought down without much trouble and at comparatively little expense. The contract rates for a large portion of the Tharrawaddie timber varied from 1 to 5 rupees per log, large or small. These peculiarly favorable circumstances ceased to operate in 1857-58.

In that year, the average rate paid for a log of 293 cubic feet was 7-1. But the timber of 1859-60, had the average cubical contents of 37.25 cubic feet and ought therefore in proportion to its cubic contents to have been paid for at the rate of 8-15-6. But the rates actually paid were 11-0-0, or 2 rupees more than they ought to have been. This rise of 2 rupees in the average rates paid per log to forest contractors, beyond what was justified by the increased size of the timber, was caused by the small number of parties willing and able to take forest contracts. In many instances it was necessary to raise the rates, in order to secure the working of a forest at all.

Scarcity of elephants and the greater difficulty of removing the old seasoned timber remaining in the forests, have tended to decrease the number of eligible forest contractors, and to increase the rates which had to be paid to them.

In 1857-58, the rate for doogies delivered at Rangoon varied from 9 to 12 rupees, it now varies from 10 to 15 rupees for logs with a middle girth of 6 feet, and rises further as the girth increases. The rates paid for other classes of timber have increased in proportion.

The average quota of expenditure for establishment and contingencies per log from 1856-57 to 1858-59, has been 4-5-0. It has been double this year. But then, if the forests had been worked properly, twice the number of logs would have been the result, and this would have reduced the quota of miscellaneous expenditure to a reasonable figure.

Thus the amount of timber brought down, and the amount expended on the same are questions intimately connected with each other. The present system has, to a certain degree, proved faulty in both points. It has not yielded that supply of timber which we might have been justified in expecting, while the rates paid for the timber have been too high.

We can only hope to decrease the rates by making ourselves, to a certain degree, independent of the present contractors, and we can increase the amount of timber only by returning to the system of petty contracts, thus sub-dividing the work and adapting the series of operations to be carried on by one contractor to the capacities of the people with whom we have to deal.

61.—The number of logs sold this year has been 15,416, with  
No. of logs sold during the year.      cubic contents of 11,689 tons. This

is about four-fifths of the timber sold in 1858-59. But the amount realized does not even equal two-thirds of that of last year.

The statement on the margin shows the general results of the sales from the commencement. It will be seen, that although the size of the timber was greater this year, yet the price calculated both per ton and per log has been loss. The average rates realized per log have been 15-1-11, which falls short of the rates expended by more than 4 rupees, so that had not a large quantity of timber been on hand, making the number of the logs sold greater than the number of logs brought in, the consequence would have been a considerable deficit. The cause of this unfavorable result was the low state of the market at the time the large sales were held, in January and February, when more than one half of the timber sold during the year was disposed of. Statement No. VII. shows that the price realized for the two principal classes of timber, doogies and loozars, in January and February, 1860, is less than one half of what it was in November, 1858

and January, 1859, and less than at almost all other sales held since the commencement. Trade was then very low at Rangoon, and the number of bidders at the large sales unusually small. Yet the number of logs (8000) once announced, the sale could not be put off. The prices were more favorable both before and after the sales.

To avoid a similar mishap, it will be necessary hereafter to limit the number of logs to be sold in the large annual sales, and to rely more on the smaller sales, held whenever a demand for timber is apparent.

Nearly the whole of the timber has been sold at Rangoon, a neces-

*Statement showing timbers sold at Rangoon, Prome and Tounghoo.*

Stations.	No. of logs.	Amount realized.
Rangoon,.....	14622	229,072 3 6
Prome, .....	718	8,749 13 4
Tounghoo, ...	76	273 0 0
Total, ...	15416	238,095 0 10

*Statement showing results of sales from 1856-57 to 1859-60.*

Years.	No. of logs sold.	No. of Tons.	Amount realized.	Average amount per log.	Average size of the log in cubic feet.	Average price realized per ton.
1856-57	8227	5993	75264	9 1 0	86	12 0 0
1857-58	16201	7815	112054	6 14 0	24	14 0 0
1858-59	20561	14617	375923	6 2 18	36	28 0 0
1859-60	15416	11689	238095	15 1 11	37.9	19 15 0
Total,	60535	40044	796387	14 4 11	38.	7 7 3

sary consequence of the plan of concentrating the timber at that place.

But it has been urged that facilities for the export of timber ought to be given in like manner for the port of Bassein, and, to meet these demands, arrangements will be made to retain,

as an experiment, a portion of the Prome timber for sale at Prome, which will enable the purchasers to take it down to Basscin.

Revenue realized. 62.—The Revenue of the Forest  
Compare Statements VIII. and IX. Department consists of

A. Amounts realized by the sale of timber,	
amounting in 1859-60 to, .....	211,980-15-6*
B. Miscellaneous revenue in 1859-60 to, .....	5,522-12-6
	<hr/>
Total,...	217,503-12-0

The amount of the miscellaneous revenue is necessarily small, if compared with the sums realized by the sale of timber. In the three years preceding this, it amounted to 6 per cent. on the amount realized by timber sales, this year it is only  $2\frac{1}{2}$  per cent. Of its different items one only calls for particular notice.

This is the salvage on drift timber awarded to claimants, 1,718-8. The number of logs for which this amount was realized was 118, being at the rate of Rs. 14-9 per log. This was a portion of 1160 logs of drift timber brought in during the year at an expense of Rs. 1,937-4-4 for salvage and floating, and of Rs. 4,120-13-4 for general timber expenses, or at a total expenditure of Rs. 6,058-1-8, making a total amount of Rs. 5-10-3 per log; to which Rs. 8-10-7 on account of establishment and general contingencies must be added, making a total of Rs. 14-4-10 per log.

Of these 1160 logs, the greater portion was drift timber from the Government forests, or timber once lost and afterwards captured again; (the amount of timber lost during the year from the different stations having been 898 logs,) only a small portion was private timber. The rates paid by claimants are high, because most of the logs restored to claimants, were brought in from the sea-shore, and the expenses in bringing in this timber, nearly equal those paid for bringing timber from the forests. Nearly the whole of the drift timber collected near the sea-shore is timber lost in the Sitang river, the floating down of rafts there being more dangerous than in any other river in the country.

\* This is the amount actually realized during the year. The result of the sales shown as Rs. 233,095 in para. 60 includes Rs. 21,114-1-4, being the amount due for timber sold during the year but not paid for within the year.

63.—The unfavorable results of the sales have naturally rendered the revenue of the Department during the year anything but satisfactory.

The financial results of the four years under review have been, in round numbers, as follows.

Year.	Deficit.	Surplus.
1856-57	70,085-0-0	
1857-58	174,492-0-0	
1858-59		231,640-0-0
1859-60		43,845-0-0
<hr/> Total, 244,577-0-0		<hr/> 275,485-0-0

The ultimate surplus therefore is 30,908, to which must be added as assets the following items :—

Amount due for timber sold during the year and not paid for till after 1st May, 1860, .....	21,114-1-4
Value of timber on hand (paid for),.....	13,755-9-0
Surplus,.....	30,908-0-0
<hr/>	
Total,.....	65,776-10-4

64.—This general result of the first four years of the working of the Pegu Forests on Government account is not only unsatisfactory, it is in no way adequate to the toil and anxiety the work has entailed. It is, however, only the result of the first necessarily more unfavorable period, during which the organization of the Department had to be commenced, many expensive lessons had to be learnt, and in which the only resources for the realization of revenue consisted in the old timber left in the forests by former workers.

Were we at all justified in taking a more favorable view of the labours of a Department naturally unpopular, the circumstance might be taken into account that it has been possible to carry on the work with no actual loss, without indenting upon the real resources of the forests. The timber hitherto brought down has not, with few exceptions, deprived the forests of one single living tree. The forests have been preserved intact, and have been made, under the most unfavorable circumstances, to pay their expenses.

65.—It is here the place to compare the results actually attained

Estimates compared with results actually attained. with the estimates made at different times. In a Department which must incur expenditure, in order to ensure the possibility of success at some future time, prospective estimates extending over a series of years, are indispensable, but since the revenue side of the same depends on circumstances over which we have no control, viz. the greater or less difficulty of procuring the means for bringing the timber to market, and the prices likely to be realized by the disposal of the same, the accuracy of these estimates is a very unsafe one. Statement No. X. shows the comparative figures of the different estimates made, compared with the results actually realized.

The first estimate of the timber likely to be brought down and the revenue likely to be realized, is contained in Table 9 of my first annual report, dated 16th December, 1856. This estimate was based on a cursory examination of the forests by myself, which led to a necessarily incorrect estimate of their resources. The next estimate was prepared in August, 1857. This was based on a more perfect knowledge of the resources of the forests, but it was made at a time when the operations of bringing down timber by means of forest-contractors were progressing in the most satisfactory manner. The check experienced a few months afterwards, through the sale of the elephants employed in the forests could not then be foreseen, and a steady progress was confidently anticipated.

Both these estimates are in excess, both as regards the timber brought down and the revenue realized.

Only the last estimate, prepared in November, 1859, approaches the truth, as far as estimates under the circumstances noted, can be expected to approach it.

Hence, it is evident that it would be utterly vain at present to risk any further estimate of timber that may be expected or of revenue likely to be hereafter realized. We can only say, that, as far as our knowledge of the forests goes, we are justified in assuming that 128,047 seasoned trees are at present in the forests, ready for removal, and that we may girdle annually about 30,000 trees in girth above 6 feet, but *when* these trees will be removed, and *what* will be the financial results of these operations, we cannot venture to predict.

66.—With these prospects before us, certain as to the resources of the forests, but uncertain as to the means of making them available for the market and for the resources of these provinces, it requires no explanation that a change in the system of working, at least by way of experiment, was called for.

The probability of the contract arrangements proving insufficient, was first felt in November, 1859. What was required, was to introduce a new and more efficient agency.

67.—This, it has been attempted to effect in two different ways, in one part of the forests by converting contractors into permit holders, in another by employing Government elephants, and Government agency.

The permit holder, on paying a certain amount of purchase money per log, becomes the owner of the timber brought out by him, he does not receive any advances from the Forest Department, but is expected to derive his means for working the forests from such parties as may afterwards take the timber off his hands.

It may be expected that these parties will succeed in inducing the forester to work to better advantage than the contractors have hitherto done. In spite of strict orders, and the high rates given for yard and mast pieces, contractors frequently cut up beautiful long logs into short lengths, sometimes, it is true, because the locality does not admit of the removal of long timber, but often because they find it more convenient to bring down logs of 20 or 30 feet in length.

The forest contractor works for certain fixed rates, but the permit holder is in the more free position of the seller of his own goods, he will therefore be impelled by the hope of himself deriving all the advantage from the superior quality of his timber and the rise of prices. In order to ensure high rates, he will be careful to cut his timber into such shapes as are likely to command the highest price.

These are some of the advantages which may be anticipated from the permit system. But the disadvantages on the other hand must not be overlooked.

The permit system may be expected to lead to favorable results, only as long as there is a sufficient number of efficient foresters ready to take permits to ensure competition.

The permit holder being in a position less dependent on the Forest Department, will naturally be less careful in the observance of forest rules, than the contractor. Unless he feels himself watched by active and vigilant officers of the Department, he will soon begin to regard himself as the bonâ fide owner of the forest; in the same manner as the permit holders in the Attaran Forests did thirty years ago. Or should he be afraid of the consequences himself, he is yet not likely to be diligent in preventing people connected with him from girdling Teak trees, cutting down green timber, or otherwise injuring the forests.

The penalty for breaches of the rules or the provisions of permit, is expulsion from the forest, and this penalty can, without inconvenience, be enforced as long as there is competition for the permit.

But if parties ready and able to take up the forest thus vacated, and to carry on the work thus suddenly interrupted, are scarce; then the officer ordering the expulsion of the former holder, will find himself in an awkward position. The step he takes for the protection of the forests, is certain to decrease the revenue to be realized by him, and may expose him to blame for interfering with the supply of timber for the market.

Not many officers of the Forest Department are likely to take upon themselves the odium of such unpopular measures, and the result may be expected to be similar to that experienced in the Attaran forests, that is, wanton destruction of the Teak, because it was thought dangerous to interfere with the arrangements made by timber-traders for the bringing away of the timber. With such precedents before us, it would not have been wise, at a time when foresters were scarce in Pegu, to introduce the permit system into the whole of the forests at once. The plan must be carried on as an experiment in a portion of the forests only, until such time as parties able and willing to work, come forward in sufficient numbers to ensure competition. Until that time, the Forest Department must maintain its independence intact in one portion at least of the forests, so as not to let the market depend for timber on the permit holders alone.

The conditions and general features of the permit system are set forth in letter No. 227, dated 9th November, 1859, and need not here be repeated. A form of permit is attached hereto.

It was first intended to issue permits for the whole of the Sitang



Forests, the Promo and Bassein Forests. From the statement showing permits issued for 1860, it will appear, that this plan has been carried out as far as the Sitang and Bassein Forests are concerned, but that one permit only has been issued for a portion of the Shwoelay Forests in the Promo district.

The rates to be paid by the permit holders for their timber were fixed at Rs. 8 for all logs in middle girth above 4' 6", at Rs. 4 per log not attaining that girth, and at 8 annas for small pieces, in girth below 3', or in length below 12', the latter rate being intended to include small crooks, and material fit for railway sleepers.

These rates have been maintained for the Sitang forest, but for the Bassein forests, whence no timber had as yet been brought down by the contract system, and where the timber is supposed to be generally small, a uniform rate of five rupees per log all round, has been substituted and in the North Shwoelay forests, which at the time the permit was issued, were entirely closed, on account of the obstructions in the Shwoelay river west of Pongdah, the uniform rate was fixed as low as 4 Rupees. The Shwoelay permit holder is not likely to bring out much timber. He did not make his appearance or commence the cutting of timber in the forests till June, when nearly one half the time granted for the permit had expired. For the remainder of the Promo forests, no suitable offers were made.

The Sitang and Bassein forests are two isolated tracts, well suited for the experimental carrying on of the permit system, but even here, it has not been possible to obtain permit holders for all the forest districts. It would therefore be useless to extend this experiment over the forests in the Promo district.

The first permit issued was one for the Kyoukehounggaley, in the Bassein district, in force from the 16th July, 1859 to the 1st January, 1860. The permit holder has brought down to Bassein 37 logs.

68.—The other attempt to introduce another agency into the Working of the Forests by means of Government elephants and Government agency.

Among the contractors in the Southern and Irrawaddy forests, there are only seven parties possessing a sufficient number of elephants and other means, and having, at the same

Tharrawaddie.

1. Moung Myke. Beeling.
2. " Tay. Minhn.
3. " Byoung. Htoo.

4. Moung Ta. Tounyo.  
Southern.
5. Moung Bjah. Pegu.
6. " Barah. Pounghin.
7. " Toonbyro. Dakkan.

time, knowledge of the work and sufficient energy to work a forest district.

For the remaining districts either no contractors at all came forward, or only

such as had no elephants, and required large advances to hire buffaloes, without affording sufficient security ; yet among the latter there are men of energy, who are well skilled in the work, and thoroughly acquainted with the localities.

Instead of risking advances, it appears safer to make over to such parties Government elephants to carry on their work. And again, it would seem, that the energy of such parties could be turned to better account, if only a portion of the work were entrusted to them, say to one party the felling and the superintendence of the dragging, to another the floating to the main river, and to a third the bringing down of the timber to Rangoon. This was the idea which led to the establishment of the Superintendent of Forests' Head Quarters, as a temporary measure, in the Tharrawaddie district, so as to ensure a more effectual carrying out of the plan described in a portion of the Prome and Tharrawaddie Forests.

It is not, as a rule, intended to do the work by direct Government agency, that is by men hired by officers of the Department, but by means of petty contracts with the assistance of Government elephants and under a minute supervision by Government officers.

It was first proposed to work with the elephants already belonging to the Department, four in number, all well-trained animals, and to add to them a number of others, hired from the commissariat under certain conditions ; and with the concurrence of the General commanding the division, thirty commissariat elephants were placed at the disposal of the Forest Department, to be selected from those at the station of Thayitmyo. This was in January, 1860, and I immediately proceeded to Thayitmyo, to select the elephants myself. But it soon became apparent that only a small number of animals fit for timber work could be found, and I was obliged to content myself with sixteen ; a number far too small to justify any expectations of success in the plan proposed.

The utmost amount of timber a well-trained elephant in good condition, can be expected to drag to the river-side in these forest districts in one season may be put down at 150 logs, averaging one

ton each. But the commissariat elephants were not trained at all to timber dragging, and when put to it, did but little, and were constantly subject to sore backs and other ailments, curtailing their time of work. Besides this, it must be taken into account that during the S. W. monsoon, which is the time when most timber is dragged in the forests, some elephants would always be required for the carriage of stores, and for the tours of inspection of the officers of the Department through the forests, most of the roads being utterly impracticable for other means of conveyance.

69.—The remaining number would therefore be insufficient.

Elephants available from the Commissariat Department not sufficient. After due consideration it was thought that unless a sufficient number of animals could be obtained to bring away 5,000 tons of timber annually, likely to realize about 100,000 Rupees, it would not be worth while entering upon the experiment. This, it was estimated, would require fifty animals.

Steps were immediately taken to fill up this number from the different sources, but this belongs to the Report of 1860-61, as the animals were not obtained till after the commencement of that year.

The forest districts which it is intended to work by these means are, in the Tharrawaddie division,

Toun Choung forests, stream blocked up in its course.

Bobin ditto ditto ditto

Mimboo, stream cleared during the year.

In the Prome division,—

Shaboung, } stream cleared during the year.  
Shwoelay, }

A portion of the Nawing and Boolay Forests.

70.—But the introduction of a greater number of elephants is

Other improvements contemplated by this mode of working. not the only object of the present experiment.

The preparation and handling of the timber by means of forest contractors, as carried on hitherto, has been an extremely rough and primitive process.

A few improvements, it is true, have been attempted. Trees are no longer felled, as was the custom formerly, at a height of from 5 to 10 feet from the ground; but to induce the forest contractors to fell all Teak trees close to the ground, is out of the question. It is true

this change has not that value in these forests which, at first sight, might be attributed to it. Few large Teak trees are without a flaw or hollow in the heart of the stem near the ground, caused probably by the effect of the annual fires upon the stem of the young trees. And the difficulty of finding tall trees that can be turned into mast pieces, is less than that of getting dragging roads sufficiently clear and even to admit of the removal of the pieces entire.

Yet there are instances when the value of the trees might be enhanced by several hundred Rupees, if felled close to the ground or if even a part were dug out of the ground.

Another improvement to be aimed at is the cutting of the tree into suitable lengths. The foresters are in the habit of cutting all pieces as much as possible into uniform lengths of either 30 feet or 18 feet. But this frequently renders the top utterly useless, whereas when the tree is cut up with judgment, it might yield two pieces of value. And in many instances a tree which the forest contractors would cut in two or three pieces may, with some energy, be brought down entire. Besides this, there is the cutting of crooks, which our foresters have not yet been able to learn.

Minute superintendence, exercised by Europeans acquainted with timber, appears to be the only means of securing an economical, and rational practice of felling and cutting timber. A few years will suffice to train the native forester in this respect, and then the European superintendence may be discontinued.

But we must go further. There are now in the forests numerous trees girdled and felled, with a girth of from 9 to 12 feet; such trees cannot be dragged six miles over the ground, nor can they be brought out from between difficult hills. Nothing is left but to saw them up into long planks or into three squares each, one of which is cut out of the middle. By converting timber in intricate localities into pieces easy of removal, many forests that at present are considered impossible to work may be made to yield fine timber.

In the plains, the additional facility of employing timber carts ought to be given. Indeed the employment of sling carts will be one of the most important improvements, as it will, in the plains at least, gradually enable us to a great extent to dispense with elephants as a moving power.

Then again for the purpose of opening obstructions whether by the blasting of rocks or by the digging of canals, it is necessary to

have European supervision at hand throughout the year. This cannot be secured, unless there is a central place near the forests, where the parties can be acclimatized, and all stores and implements collected. It cannot be expected that real improvements, either in the preparation or the removal of timber will be effected, unless the officers or overseers superintending the same, live on the spot. Occasional visits to the forests, whether in the rains or in the dry season, lead only to measures which remain on paper, and to improvements which are never carried out. Moreover, visits to the forests in the rains from any station on one of the main rivers are always exceedingly tedious and expensive; whereas by an overseer residing in the forests, the work can as easily be inspected in the rains as in the dry season.

The remark has frequently been made, that the timber-traders at Rangoon would be quite content with what natives can do in the working of the forests. This may be true for those forests when there are no natural obstacles, where the trees grow by the side of the waterway, and in such abundance, that at least for the present, it does not matter whether the timber is husbanded or not. But it does not hold good in the forests in this province, where natural difficulties are numerous, and timber not sufficiently plentiful to admit of waste.

Yet even in the Attaran district, which was, of all forests known, the easiest to work, and if its limited size is regarded, one of the richest, when this work was at its highest, from 1830 to 1840, it was superintended by Europeans who were stationed in the forests.

71.—It is clear that, under these circumstances, the temporary transfer of the head quarters of the Forest Department to the vicinity of the forests, was a matter of vital importance for the success of the work.

A central situation was required, with easy access to the forests all round, and not at too great a distance from Rangoon.

And the locality was to be healthy, and not too remote from large villages. After much anxious deliberation, the selection fell upon the site of the old town of Myoduin, in the Tharrawaddie district, about 110 miles north north-east of Rangoon.

On three sides it is surrounded by valuable Teak-producing tracts, viz. to the north, east and south. Its distance from the main Yomah range, the eastern limit of the Tharrawaddie Forests, is twelve miles in a direct line, and its distance from the station of Mingee on the Irrawaddy river is twenty-four miles.

72.—The advantages of the situation of Myoduin are, that it is Advantages of the situation of My- close to some of the best Teak localities  
oduin. in the country, and that, at the same time, villages are not far off; so that the difficulty of procuring labour and supplies is somewhat less than is usually the case near the forests.

Whether the place is likely to prove healthy or otherwise, it is impossible beforehand to determine. But if good drainage may be considered as an advantage in a sanitary point of view, this has been secured: for the place is situated between two streams, running nearly parallel, for about two miles, at a distance of only a few hundred yards from each other.

Instead of a locality in the Tharrawaddie Forests, the experiment might have been undertaken in other forest districts with a similar abundance of Teak, and fewer obstacles to the removal of the timber. The Bimbyaih and Gwaythay Forests, north-east of Toungoo, for instance, might have been selected. There, the success as far as the removal of timber was concerned, would have been easier, but it appeared doubtful whether it was justifiable to locate Europeans in those forests which, on account of their situation at the foot of high mountain-ranges, are much more exposed to malaria. The advantage of the Tharrawaddie Forests is, that the whole of the country is annually cleared by fires, all leaves, and other organic matter being burnt before it can decay.

The old highroad (Minlan) from Rangoon to Ava passes Myoduin at a distance of three miles from the place. This road leads through the belt of dry *Dipterocarpus* forest, and is practicable throughout the year; the only difficulty being the crossing in the rains of the numerous streams running from the hills to the south-west. But steps have been taken to obviate this difficulty, by stationing boats at the different fords, and building rough bridges wherever practicable. The keeping open of this highroad through the Promé and Tharrawaddie district, would be a great advantage for the officers of the Forest Department, as it would enable them at all times of the year, with comparative facility, to visit the different parts of their district. The road, however, almost continuously leads through forests, and hence is much exposed to being obstructed by fallen trees.

An officer located at Myoduin, commands the whole range of forest districts between the Yomah range and the Irrawaddy river from the Southern Forests to the frontier.

73.—And the value of a position like this will equally be felt,

The location of the head quarters of the Forest Department not merely a measure of a temporary nature.

when the contract system shall have given way to the permit, or any other system. For the officer in charge of

the district will then be able to ensure the protection of the forests; while he is near and able to visit the forests at all times without great preparations, the holders of permits or licenses are more likely to abstain from girdling trees on their own account, or felling green trees, or trees insufficiently seasoned, than when he is away at a station, and unable to visit the forest at a moment's notice.

The location in the forests of officers of the Forest Department, may even make it possible hereafter to sell the seasoned trees, as they stand in the forest, leaving the purchaser at liberty to convert them into such shapes as he may deem most profitable, and thus to close the whole of the transactions in the forest. There are, however, as yet great objections to this plan. If it is at all possible to overcome these objections, this can be done only by officers of the Department residing in the forest and not at stations far away from their work. Independently of the working of the forests, it is evident that the plan of locating a portion of the officers and subordinates of the Forest Department in the forests, will make it easier to train them to their work. In Europe where regular forest management is introduced, the officer in charge of a forest district lives in the forest, and at no other place.

74.—A commencement has been made to clear some of the numerous

Clearing of obstructions in the streams required for floating timber.

obstructions impeding the floating of timber from the forest. The digging of the canal intended to open the Shwoelay Forests has above been alluded to, the works were not completed till the end of May; the subject must therefore be reserved for next year's Report. Another work of similar importance was commenced but not completed during the year. This is the leading of the Bobin Choung into its old channel, the new course (Tsain Choung) being unfit for floating timber, and having moreover the disadvantage of causing extensive inundations that annually destroy large extents of paddy cultivation.

It was hoped to finish this work also in time to admit of the Bobin timber being brought down in 1860-61. But the inhabitants of that district who had suffered most from the inundations of the Tsain Choung, and who had promised to undertake the work in case the

old channel was to be opened, failed to fulfil their promises, and the work had to be given up when it was only partially completed. No timber therefore can be expected this year to reach Rangoon from the Bobin forests.

Regarding the opening of mountain streams, by the blasting of rocks, application for a detachment of sappers and miners, to be employed for blasting operations in the forests was made in November, 1858, a report on some of the obstructions first to be removed accompanying that application.

No. 82 D., dated 9th November, 1858.  
From Superintendent of Forests to  
Commissioner of Pegu.

The employment of sappers was not sanctioned, but permission was given to entertain a party of artificers for the purpose. After several fruitless attempts to engage men acquainted with the work at Rangoon and Maulmain, an application was made to the Executive Engineer at Dowlaishrum, December, 1859, to engage and send over a number of quarrymen, for the purpose. The party arrived in May, too late to commence operations during the dry season, but, with a view to acclimatizing them in the forests, they were at once located at Myoduin, where there is ample employment for them until their work can commence in the making of dragging harness for elephants, and other tools.

Provisions for the supply of seasoned timber in future years.

carried on in the Pegu Forests.

75.—During the year under review, no girdling operations have been carried

It will be remembered, that the plan was to girdle annually in one of the six divisions only.

None made in 1859-60.

This plan has been carried out in

the following order.

Year.	Div.	District.	No. of trees girdled.	Available in
1857	I.	Tharrawaddie.	50,018	1860-61
1857	II.	Prome, East.	36,359	1860-61
1858	IV.	Southern Forests.	44,272	1861-62
1859	VI.	Sitang, East.	13,759	1862-63
1860	III.	Western Forests.	None	—
1861	V.	West Sitang.	"	—

But from the experience acquired hitherto, it does not appear likely, that means for removing more than 25,000 logs annually will



for the present be available. At this rate the supply already prepared would hold out for the next six years, provided all minor obstructions in streams are removed within that time.

Girdling a further quantity therefore at present would only be exposing it to the danger of being burnt or blown down before it can be removed. Two divisions are left the third (Western Irrawaddy Forests), and the fifth (Western Sitang Forests). The Western Irrawaddy Forest, being comparatively poor may, in this rotation, be altogether omitted. A number of trees in the fifth division may be girdled in 1861, and this will close the first six years' rotation.

76.—It is here the place to review the mode in which girdling operations have hitherto been carried on, and to notice the errors and disadvantages of the former plan, which experience has revealed, and the improvements which appear to be called for.

Review of the girdling operations hitherto made.

Change of order.

First, as regards the order in which the work was conducted. The intention to girdle in the six divisions according to their order was deviated from in 1858.

The operations of that year were to have been carried on in the third division (Western Forests), and preparations had been made accordingly. But in January it was found that the current work rendered it advisable for the Superintendent to remain for that season as near to Rangoon as possible, and accordingly as no European Assistant was then available to superintend the work; operations were commenced in the Southern Forests instead.

And in 1859 the sixth was selected in preference to the fifth division, as this was the nearest to the forests under control of the Maulmain office, it being intended that the officers of that side should, for a part of the dry season, be present at the girdling operations, so as to have an opportunity of becoming acquainted with the method pursued. This plan, however, was frustrated.

Yet it will be practicable in the second rotation of six years to revert to the order originally proposed; for both in the fourth and sixth divisions, large portions of the forest have been left entirely unworked. And thus the second girdling operations in these two divisions may be carried on at any time without endangering the safety of the forest.

77.—Secondly, as regards the selection of trees girdled. In 1857,

The operation of marking all first class trees dispensed with.

the plan was to mark all trees of the first class, and to girdle one out of four of the trees thus marked, such localities excepted where, on account of the obstacles to the removal of the timber, or from other causes, girdling was altogether prohibited. The marking was intended to guide the officers charged with selecting the trees to be girdled, when the operations should have to be conducted for the second, third, and fourth times in the same forest.

But experience has since shown, that the advantages to be expected from this plan are not sufficient to warrant the extra expense incurred on account of the marking, and hence this practice was abandoned in 1858 and 1859. It was found, that it was preferable to make a forest survey of every locality before selecting the trees to be girdled, with a view to determining the proportion of first class trees that may without injury to the forest be removed.

78.—The rules laid down for the selection of the trees to be

Numerous trees not likely to yield good timber girdled in 1857.

girdled in 1857, are given in the Appendix to the Report on the Pegu Forests for 1856.

These rules contain several provisions which experience has shown may lead to mistakes, and which have therefore been since altered.

These are—

Rule 7. All trees that are beginning to be Nathat, either because attacked by parasitic plants of the ficus family (Njounghen) or from other causes, are to be girdled without exception.

Rule 10. Trees that are hollow or that show other signs of decline, are to be selected in preference to those that are perfectly sound.

It was perfectly correct to direct all trees attacked with opiphytic ficus to be girdled. For the life of the opiphyte is so tenacious, that all attempts to free the tree are unavailing. Once fairly established on the tree, it gradually encircles its stem, and at last forms so thick an enclosure that the Teak tree within cannot afterwards by any means be made available. The only plan therefore is to kill the trees as soon as the epiphyte is discovered.

But the provision to girdle trees that are showing signs of decay (Nathat) and that are hollow has, to a great extent, been misunderstood.

It being easier to girdle a tree, one side of which is dry, or which is hollow, the girdling parties have taken advantage of it, and the proportion of good sound timber prepared for removal is small.

79.—There was another disadvantage in the general arrangements made in 1857. The districts in which the girdling was carried on in 1857, too extensive. Their size limited in 1858. The operations were carried on were too extensive, hence it was difficult to exercise a sufficiently minute control over the work.

When girdling trees in the fourth division in 1858, the following arrangement was made to obviate this disadvantage. The Southern Forests consist of three portions, the Pegu, Ponglin, and Hline forests. The Hline forests may be estimated to contain about one-third of the first class trees of the whole.

It was determined to girdle in one portion only, and to reserve the two remaining thirds for the two next rotations. Under this arrangement, it was admissible to girdle three-fourths of the first class trees in the place of one-fourth, which would have been the proportion, had the operation been extended over the whole division.

The selection of three-fourths of the first class trees was ensured by fixing seven feet as the minimum girth of the trees to be girdled, it being supposed that the trees between six and seven feet in girth would prove to be equal to one-fourth of the whole of the first class trees. The survey mentioned in para. 67, showing the proportion of the trees girdled to that of the first class trees to be as 13 to 18, proves the above supposition, upon the whole, to have been a correct one.

The Hline forests have thus lost three-fourths of their first class trees, but will be spared further girdling operations for a period of 18 years.

The removal at one time of so large a proportion of the first class trees was justifiable in the Southern Forests, because the trees of the lower classes were very numerous. Yet it will be necessary carefully to watch for a series of years, the effect of the experiment in this part of the forests, before it can be attempted in another. If it can be carried on to a greater extent, it will considerably facilitate the girdling operations, as it is much easier to collect coolies for the work, when the trees to be girdled stand close together than when they are scattered over a wide extent of ground.

80.—In 1859 several important improvements were introduced:

Improvements introduced in the girdling operations in 1859.

The standard size of the trees to be girdled was raised from 7' to 8' 3".

Only trees of good growth and such as were perfectly sound were to be girdled. Those that were attacked with epiphytic figs, and those that showed signs of decay, were only to be girdled in case they were straight and good.

It had been settled in accordance with the practice of former years, that the number of trees to be girdled was not to exceed one-fourth of the first class. But soon after the work had been commenced, it was found that the forests were by no means so uniform in their character, as throughout to admit of the girdling of the same proportion.

81.—It was evident, that in forests where the number of first class

Proportion of trees to be removed to be determined in every instance by a forest survey.

trees was equal to twice the number of the second class, a period of 24 years would be utterly insufficient to enable the second class trees to replace those of the first.

Additional rules were therefore established, directing that a forest survey should be held in each district, before determining the proportion of first class trees to be removed.

This indeed is the only sound principle to guide in the selection of trees to be girdled, and the practical application of the same resolves itself into the following rule.

Whenever a forest tract belongs to class A. or B., that is, whenever the number of first class trees is larger than that of the second, the number of trees should be, according to circumstances, either one-sixtieth, one-fiftieth or one-fortieth of the first class trees; the proportion to be determined by the time which it may require to bring the trees of the second, and a portion of those of the third class to the standard of the first.

Whenever a forest belongs to class C. with the number of second class trees exceeding that of the first, then the number of trees to be removed may be one-thirtieth of those of the first class, six years being added to twenty-four in order the more to guard against injury to the forests.

Thus with six divisions, the proportion to be removed once in six years will vary from one-fifth to one-tenth.

82.—The main improvement to be introduced in the operations of

A share to be allowed to contractors and permit holders in the operation of girdling. girdling is, to grant the foresters a share in the work of selecting the trees.

As soon as the felling of the new girdled trees commenced, it was felt as a serious drawback, that the trees had been girdled by one party, and were now to be felled and removed by another. Teak is so scattered over interminable tracts of dense forest, that to find trees is frequently an undertaking of no common difficulty; nor would it be practicable to facilitate this by entering each tree in detailed forest maps. To make such maps for one division only, would occupy for several years a large establishment of surveyors.

It is true that the Forest Goungways are a great help in this respect, they are expected to know every locality where seasoned timber is standing, but being Burmese, they scarcely come up to this standard of proficiency, and besides, such knowledge is an entirely personal property, which is lost when the Goungway dies or leaves the Department.

Thus it frequently happens, that foresters, commencing work in a new locality, have to pay for having the trees pointed out to them, and if they do not succeed in finding the whole number, they naturally complain that the trees are not in existence. Or the foresters find that the best trees in the forest have been spared, and that a large proportion of those which yield inferior timber only have been girdled. Or they consider that the trees are in localities too difficult to work.

All this naturally gives rise to the complaint, on the part of the foresters, that there is no timber worth working in the forests, and the possibility of such complaints must be carefully guarded against, for with our forests constituted as they are, it would be difficult to disprove them.

They can, however, be guarded against by calling upon the foresters, either contractors or permit holders, themselves to superintend the work of girdling, of course under the same rules and the same supervision by Government Officers, as if the work were done by coolies hired by the Department.

It will then be the interest of the foresters to see, 1st, that the full number is girdled; 2nd, that only good trees likely to yield valuable timber are killed; 3rd, that localities are avoided which at present offer difficulties to the removal of the timber.

It will be the duty of the officer of the Department to see that the proportion of trees which should be killed in each locality is not exceeded, that the largest trees are selected in preference to the smaller sizes, and that all trees attacked with figs, or valueless for seed-bearing, are girdled.

It is true that the contractors and permit holders have the right of removing timber from a certain forest tract for one year only, but they have this right on the understanding that if they succeed in bringing out a quantity of timber, proportionate to the resources of the forests, and do not violate the forest rules, the contract or permit will be prolonged to them; and the circumstance of their having been employed in girdling, will make it still more their interest to retain their forest, a circumstance which cannot but operate advantageously.

One point of importance must here be observed. The girdling of the trees must be paid for by the Forest Department, and not by the permit holder or contractor. The latter plan might be considered as preferable, because less expensive. But this is a fallacy. If the girdling is paid for by the contractor or permit holder, he will naturally lay claim to a kind of ownership of the trees, and this will lead to difficulties and complication, whenever it is necessary to change a contractor or permit holder.

83.—It is here the place to mention the method pursued for controlling the work of girdling.

Mode of controlling the work done.

The working party is located in the

forest. After the survey is made and the proportion to be girdled is determined, the Tenk localities situated around their encamping ground are portioned out, and are worked in a certain order, north, west, south, east; a native subordinate of the Department is attached to each working party, and keeps the account of work done each day.

After the completion of the work is reported, it is the duty of the officer superintending it, personally to go through the forest, and to examine it, having the accounts of the different sides separate, he is able, after seeing the greater part of the trees girdled in one or two localities, selected at random, or after seeing a portion of those girdled in all, to judge whether the statements of the daily work-book are likely to be correct.

The data of his revision are recorded in the form shown below, and no payment is made to the parties, unless he is satisfied that the

trees have been selected in the correct manner, and that the work has actually been done.

It has, in no instance, been possible for the officers of the Department themselves to see more than three-fourths of the trees girdled, and generally the number seen has not exceeded one half. Yet where the officer is known to be active and apt to surprise the working parties by taking unexpected turns in his survey, he is not likely to be deceived by them.

As an instance I give here an abstract of the revisions held of the work of girdling in the fourth and sixth divisions.

Name of officers controlling the work.	Name of Division.	Name of Forest.	Trees girdled or daily work-book.	Trees girdled well.	Trees girdled badly.	Girth not full.	Trees seen with creepers not cut.
Dr. Brandis and Native Assistants.		Thounzay, ...	18,979	10,388	130	70	160
		Oakkan, ....	16,312	4,109	283	269	528
		Magayee, ....	5,076	2,508	31	11	93
		Mayzalee, ...	3,875	2,860	29	43	48
		Total, ...	41,272	19,865	476	393	829
Dr. Brandis and Mr. E. Clemen.		Padu, .....	3,497	1,889	None.	None.	No creepers found uncut.
		Moong, .....	2,331	1,083			
		Youkthawah,	857	481			
		Thonkyahat,	1,013	411			
		Kannee, .....	3,667	2,389			
		Koonoong, ...	2,361	687			
		Total,	13,759	6,976			

84.—A revised and more comprehensive set of forest rules was sanctioned by Government on the 17th December, 1858, and published on the 1st October, 1859.

Measures taken for the protection and improvement of the Teak in the Forests.

These rules contain provisions for the protection of the trees in the forests, for the disposal of Government timber, and for the management of drift timber, and they define the powers of the Superintendent of Forests and his assistants.

Breaches of forest rules ascertained to have been committed have been few. In the Western Forests, three instances of unlawful cutting of Teak were observed by Mr. E. Clemen.

One was the cutting down of 15 Teak trees near the line of Electric Telegraph between Padoung and Toungoop, by the parties

employed in clearing it. The case was referred to the Deputy Superintendent of Electric Telegraph.

Another was the cutting down of nine young Teak trees in a newly formed Toungya in the Shwoetinga Forests. The villagers were fined.

The last was the cutting down of green Teak for the erection of a zayat near Bambonekoon village on the Opho stream. The case was referred to the Assistant Commissioner of the district.

The paucity of cases reported is no proof that the Teak in the forests is every where carefully preserved. There is little doubt but that more cases will be discovered wherever the Assistants in charge of the different districts spend more time in their forests. Yet upon the whole, the forest rules are known and respected, and their beneficial effect, towards increasing the number of Teak, is visible in all districts. Upon the whole, it may be said that the Forest Department has been successful in preserving the forests, although the measures taken for the working of them have not yet led to satisfactory results.

85.—The disposal of Government timber by sale has been noticed

Timber given gratuitously for building for the common benefit of the public.

in para. 55. Besides the timber sold a certain quantity has been given away annually without payment for the

erection of bridges, zayats (resting-places), Kyoungs, and other buildings for the common benefit of the public. Statement No. XII. shows the amount of timber given away for these purposes since 1856-57, under the provisions of para. 5. Schedule I. Forest Rules.

The applications for timber under this rule, were far more numerous than could be entertained. The difficulty is to prevent such grants from being made a pretext for the unauthorized felling of timber for other purposes, and to guard against the waste of valuable timber, when short and small pieces might be used equally well.

All precautions that appear practicable are taken, the Goungway in charge of the forest district points out the timber to the grantees, and superintends its removal within a given time. Yet timber is a slippery article, and hence caution must be used. In districts where European officers reside in the forests, it will be possible to comply to a far greater extent with requests for grants of timber under these provisions, for there is an abundance of small pieces in the forests, not worth removal to Rangoon, which instead of being allowed to be destroy-



ed by fire might be turned to account in this way. I consider liberality in compliance with these applications an important means of preserving the forests. It will prevent parties from helping themselves.

And indeed this rule is demanded by justice, it is not a mere act of indulgence. Even in those parts of Europe where forests are most rigidly preserved, the villagers near them are considered entitled to a certain share in the produce of them.

86.—The arrangements for the collection and disposal of drift timber have been noticed in para. 56.

Management of drift timber.

The control of the drift timber has been placed in the hands of the officers of the Forest Department, in order to secure the protection of Government timber, and to guard against the piracy of drift timber, so extensively practised on the Salween above Maulmein, and which is the cause of numerous litigations there.

The amount of drift timber collected on the rivers of Pegu and brought in from the sea-shore is not very large, yet sufficient to deserve attention. The number brought in during the four years since 1856-57 is shown in Statement IV. The whole amounts to 4080 logs containing 3266 tons. Of this timber 549 logs were delivered to claimants on their proving their ownership thereto. The remainder was timber from the Government Forests, or timber that had drifted out to sea years ago, and for which no claimants came forward.

87.—The measures for the improvement of the Forests have repeatedly been noticed in former

Work for the improvement of the forests, Pegu Forest Report for 1856, paras. 145, 146, 158, 164, Pegu Forest Report for 1857-58, para. 10, Pegu Forest Report, 1858-59, para 8.

reports. Statement No. XIII. shows the amount of work done and the amount expended on account of the

same, since 1856-57.

The results, however, have been far from satisfactory. The forest Goungways who ought to be employed constantly in their forests freeing Teak trees from creepers, or clearing young Teak trees, and timber lying on the ground from bamboo and brushwood, have to spend a considerable portion of their time in assisting and superintending the operations of forest contractors or permit holders, and preventing injury to Teak in the forests. In addition to this, the natural indolence of Burmans, while not under the eye of an European, is the cause of much neglect.

.. The permanent location of European officers in the forests, ap-

pears to offer a chance of improvement in this respect. It is hoped that the work of the improving the Teak in the forests may hereafter be made the duty of the timber cutters, as it is that of the parties employed in girdling Teak trees.

It must, however, be mentioned that most forest Goungways have established small plantations, and that some keep them in good order.

88.—The expenditure incurred during the year on the Teak plantation near Prome was Rupees 732-9-5, making the total amount of expenditure on this account, Rupees 5,013-13-6. The extent of the plantation is 73 acres; the expenditure per acre is therefore Rs. 68-10-11. In para. 52 of my report on the Attaran Forests, I have shown, that unless the expenditure per acre can be reduced from Rupees  $40\frac{1}{2}$  to  $67\frac{1}{2}$ , Teak plantations in this country cannot be said to be a profitable undertaking.

The expenditure incurred on the Prome plantation has already exceeded the limit, and some expense will yet have to be incurred hereafter; the whole of the ground not being as yet covered with plants, and requiring much clearing of grass and brushwood. The number of young teak Trees at the end of the year was 30,600, 1,600 of which had attained a height of from 6 to 9 feet. The oldest plants are three years old, and ought to be much higher.

Teak, if not checked by fires and weed, attains this size on good soil in one year. But the Prome plantation has had to contend with many disadvantages. It has suffered from fire; the seedlings raised in two nurseries established in 1857 and 1858, were not transplanted with sufficient care and not at the right time, and many were not transplanted at all; the weed and jungle springing up were not sufficiently cleared; and thus a large portion of the plants were choked or impeded in their growth. These were disadvantages mainly arising out of the frequent changes in the officers in charge of the Prome branch of the Forest Department. The establishment of the plantation in 1857 was decidedly premature: it ought to have been delayed till the organization of the Department had been placed upon a more secure footing.

89.—During the year under review the expenditure on account of experimental cultivation of foreign cotton has been Rupees 1,119-5-0. The results of the experiment have been recorded in a separate report. The

experiment is to be continued for three years, when it is hoped it will be possible to see whether the natives can be induced, by the distribution of seed raised here, to attempt the cultivation of varieties commanding a higher price in the home market than the cotton at present produced by them.

90.—The pay of officers and establishment, including all consolidated allowances, has, during the year under review, amounted to Rs. 57,560,

Assistants and Subordinates.

or to 33.8 per cent. on the entire expenditure. During the three years preceding this, it amounted only to 21.28 per cent. The greater proportion during the year under review is explained by the small amount of timber brought in. The expenditure is high, yet it cannot be reduced without endangering the work on the forests.

The subordinate establishments consist of—

Office establishments, Overseers, Goungs and Peons at the timber depôts and river-stations, and local forest establishment. (Forest Goungs and forest Goungways.)

The changes in the employees have been very great, so as materially to interfere with the efficiency of the Department. This was particularly the case in the local forest establishment, mainly owing to the large amount of sickness which at times prevails in the forests.

Out of the eight forest Goungways in the Eastern Promc Forests, no less than four vacancies occurred during the year, owing to the decease of the occupants.

The inconvenience arising out of the frequent changes in the upper establishment, have repeatedly been noticed in the preceding pages. It has been found extremely difficult to secure the services of officers fitted for the posts of assistants in charge of forest districts. In 1856, the post of Assistant at Toungoo, was held by the late Mr. DeRenzy, an officer of rare abilities, zeal, and judgment, whose lamented death in September, 1857, was a severe loss to the Department. Since then, this office has been in charge alternately of the Deputy Commissioner and Collector of Customs at that station, it being understood that those officers were only to exercise a general superintendence over the work of the Department and could not be expected to visit the forests. Viz.:

Captain G. DeOyly, (the late Deputy Commissioner; T. Tracy, Esq., Collector of Customs; and Captain M. Lloyd, Deputy Commissioner.

A similar arrangement was made at Promo in March 1857, from which time up to April 1859, the undermentioned officers have been in successive charge.

G. Hough, Esq. Assistant Commissioner.

Lieut. McMahon, ditto.

Lieut. A. Duff, ditto.

Captain R. D. Ardagh, Deputy Commissioner.

Captain G. DeOyly (the late), ditto.

Lieut. Geo. Street, Assistant Commissioner.

It is due to these officers to state that they did what they could to further the interests of the Department. But the work in the forests was necessarily left to the local subordinates, and to occasional visits by the Superintendent. During the dry season of 1857, Lieut. Maude, 14th M. N. I. joined the Department, as a temporary measure, to assist the Superintendent in conducting the work of girdling in the Tharrawaddie division.

In January 1858, a proposal was made to send to Germany for scientific men to fill some of the vacancies in the department. This plan received the assent of the Supreme Government; but it has not led to satisfactory results, and must, for the present, be laid aside.

The labours of the following two assistants, Mr. E. Clemen and Mr. A. G. Macdonald, have been noticed in the preceding pages.

In January, 1856, the appointment of a Deputy Superintendent was sanctioned: this post was filled first by Captain J. Kiernan, 10th M. N. I. In June of the same year he was succeeded by Mr. Henry Leeds, late Executive Assistant Commissioner, Promo.

It is an agreeable duty here to acknowledge the cordial support which the Superintendent of Forests has received from the two officers above named.

Mr. Henry Leeds has now been upwards of two years in the Department. During the greater part of this time, the Superintendent has been absent from Rangoon in the forests, and it is owing to the ability and zeal displayed by Mr. Leeds that the current work of the Department has been carried on in as satisfactory a manner as circumstances would admit.

D. BRANDIS,

*Superintendent of Forests, Pegu, Tenasserim and Murtaban Provinces.*



# STATEMENT II.

Statement showing the number of Teak trees of the different classes estimated to stand on one square mile of Teak localities in different parts of the Pegu Forests.

	Name of Forests.	Class of Forests.	First Class.	Second Class.	Third Class.	Fourth Class.	Total.	Remarks.
I. Division.	THANAWADDIE FORESTS, ...	B <sup>0</sup>	992	751	1,778	2,567	6,088	Average per Square Mile on the different classes on the tracts surveyed.
III. Ditto.	WESEEN FORESTS.							
	Matooing Choung in the hills near the Yonah, ...	C <sup>25</sup>	2,543	3,989	5,546	6,829	18,907	Per Square Per 10
	Matooing Choung in the lower hills, ...	C <sup>0</sup>	74	105	913	1,100	2,192	Mile. Acres.
	Mudday Choung, ...	C <sup>4</sup>	448	987	1,917	1,860	5,212	First Class, ..... 1,341 21
	Shwaytinga Choung, ...	C <sup>2</sup>	196	465	1,308	1,853	3,822	Second Class, ..... 1,862 21
	Thallardian Choung, ...	C <sup>2</sup>	202	553	1,639	3,268	5,662	Third Class, ..... 2,434 38
	Padashin Choung, ...	C <sup>3</sup>	329	1,387	2,927	4,702	9,345	Fourth Class, ..... 3,509 54
	Manya Choung, ...	C <sup>2</sup>	214	942	1,266	1,660	4,082	
	Okpho Choung, ...	C <sup>2</sup>	192	1,014	897	1,827	3,960	
	SOUTHERN FORESTS, ...	C <sup>6</sup>	584	643	823	977	3,027	Total, ... 8,616 135
IV. Ditto.	EASTERN SITANG FORESTS.							
VI. Ditto.	Moong and Padah, ...	B <sup>25</sup>	2,472	1,483	1,535	1,643	7,133	
	Youkthavah and Thoutkyaglat, ...	A <sup>15</sup>	1,504	683	1,447	1,777	5,411	
	Kannee and Koonoong, ...	A <sup>30</sup>	5,054	2,208	6,691	14,468	28,391	

MYODUIN, }

D. BRANDIS,  
Superintendent of Forests.  
Pegu, Tenasserim and Martaban Provinces.

7th September, 1860.

STATEMENT III.  
Statement showing the quantity of Timber brought down from the Pegu Forests from 1856-57 to 1859-60.

Division.	Names of Forests.	1856-57.		1857-58.		1858-59.		1859-60.		Total.		Total of each Division.		Average cubic contents per Log.	Remarks.
		Logs.	Tons.	Logs.	Tons.	Logs.	Tons.	Logs.	Tons.	Logs.	Tons.	Logs.	Tons.		
I. Tharavaddie.	Beeling, ..	1,350	796	1,524	1,090	667	1,412	1,017	5,376	3,907					
	Mokkha, ..														
	Minlah, ..														
	Illloo, ..	2,152	1,303	4,257	3,150	4,115	3,143	2,900	13,424	9,801					
	Kadoke, ..														
	Bobin, ..														
II. Promie, East.	Mimboo, ..														
	Tounyo, ..														
	Total,	3,502	2,099	5,781	4,440	5,205	3,810	4,312	18,900	13,601	18,800	13,601	36 feet.		
	Shwaylay, ..														
	South Naving, ..														
	Middle Naving, ..	164	126	3,963	869	633	519	422	253	5,183	1,767				
III. Western Forests.	Choung Souk, ..														
	Tsoon Choung, ..														
	North Naving, ..	1,024	530	1,220	433	208	84	128	35	2,580	1,085				
	Boolay, ..	1,188	656	5,183	1,302	841	603	551	291	7,763	2,852	7,763	2,852	17 feet.	
	Total,														
	Western Promie Forest, ..	2,609	606	1,461	236	33	22	33	22	4,139	896				
IV. Henzalah, ..	..	20	11	538	285	541	235	101	57	1,203	588				
	..														
	Total,	2,629	617	2,002	521	571	257	137	79	5,312	1,471	5,312	1,471	11 feet.	

IV. Southern Forests.	Pegu, ..	135	76	804	671	596	420	679	492	2,214	1,659		
	Pounglin, ..	715	414	1,032	667	282	184	232	168	2,262	1,433		
	Myazalee, ..	493	281	0	0	0	0	0	0	493	281		
	Magayee, ..	201	113	93	58	103	70	103	73	500	314		
	Ookkan, ..	889	506	462	332	485	319	155	127	1,991	1,284		
	Thoungzai, ..	808	427	267	170	169	108	163	96	1,407	801		
	Total, ..	3,242	1,817	2,658	1,898	1,635	1,101	1,332	956	8,867	5,772	8,867	5,572 33 feet.
V. Western Sittang.	Bhonnee, ..	190	108	0	0	136	132	45	35	371	275		
	Koon and Hpyoo, ..	0	0	0	0	0	0	211	182	211	182		
	Khaborung, ..	29	17	74	67	402	324	0	0	505	403		
	Shwah, ..	723	405	1,412	1,447	900	540	602	493	3,637	2,885		
	Myolah, ..	1,454	926	327	301	427	365	441	384	2,649	1,975		
	Total, ..	2,396	1,456	1,813	1,815	1,865	1,361	1,299	1,094	7,373	5,726	11,373	5,726 25 feet.
VI. Eastern Sittang.	Yonkthawah, ..	0	0	0	0	1,297	1,068	0	0	1,297	1,068		
	Thoukyaghat, ..	2,300	1,805	0	0	1,102	902	0	0	3,402	2,797		
	Kannu, ..	1,488	1,065	63	62	14	9	0	0	1,565	1,076		
	Koonoung, ..	1,872	1,391	383	320	17	12	0	0	2,272	1,723		
	Bimbyah, ..	3,609	2,733	0	0	70	62	30	35	3,719	2,830		
	Gwaythay, ..	0	0	0	0	0	0	0	0	0	0		
	Total, ..	9,269	6,934	416	382	2,500	2,143	40	35	12,255	9,494	12,255	9,494 39 feet.
	Drift Timber, ..	512	273	234	152	2,174	1,970	1,160	871	4,080	3,266	4,080	3,266 40 feet.
	Grand Total, ..	22,738	13,852	18,117	10,510	14,794	11,245	8,831	6,581	64,270	42,388		
Average cubical contents per log.		30.464 feet.		29.33 feet.		38 feet.		37.25 feet.					

Myoduin, }  
7th September, 1860.

D. BRANDIS,  
Superintendent of Forests.  
Pegu, Tenasserim and Marlaban Provinces.



**STATEMENT IV.**  
*Statement of Timber received and disposed of from the Pegu Forests by the Forest Department from 1st May, 1859, to 30th April, 1860.*

Disposal.	No.	Total.	Arrivals.	No.	Total.
<i>Number of Logs sold in 1859-60.</i>					
Rangoon, ...	14,385		Number on hand on 30th April, 1859, ...		
Toungoo, ...	76		Number paid for in last year and not removed....		7,251
Prome, ...	718		Number of logs received from the Forests in Pegu	7,671	350
Other places, ...	237		in 1859-60, ...	262	
<i>Drift Timber delivered to Claimants on proving ownership.</i>			Drift Timber from the sea shore, ...	908	
Rangoon, ...	112		Ditto ditto from other places, ...		
Prome, ...	6		Total,.....		8,831
<i>Number of Logs lost in 1859-60.</i>					
Toungoo, ...	67	118			16,432
<i>Balance in hand.</i>					
At Rangoon, ...	290		<i>Valuation Statement.</i>		
" Toungoo, ...	14		No. Rate. Value.		
" Prome, ...	265		Yathets, ...	308 5 0 0 1,540 0 0	
" Kyassoo, ...	262		Loozars, ...	61 19 12 0 1,262 0 0	
			Doogies, ...	211 30 10 0 6,461 11 0	
			Yard pieces,...	28 58 5 0 1,632 12 0	
			831 Mast pieces, ...	18 96 4 0 1,732 8 0	
			Crooks, ...	73 3 5 0 241 13 0	
			16,432 Shinbys, ...	109 7 14 0 858 0 0	
			Short pieces, ...	20 1 5 0 26 4 0	
			Total,...	831	13,755 9 0

D. BRANDIS.  
*Superintendent of Forests.*  
*Pegu, Tenasserim and Martaban Provinces.*

RANGOON, }  
29th May, 1860. }

## STATEMENT V.

Statement showing the amount expended on account of the different classes of Timber received during 1859-60.

Particulars.	Number of Logs.	Cubical contents.	Amounts paid Contractors.	Average amount paid per Log.	Average cubical contents of Log.	Average amount paid per Ton.	Remarks.
Round Logs.							
Yatts, ..	2,684	1,503	9,203	3 6 10	28 feet	6 1 11	
Loozars, ..	879	527	3,433	0 3 14	30 feet	6 8 0	
Doogies, ..	4,685	4,122	51,877	12 0 11	44 feet	12 9 3	
Yarl, Mast, Keel and Stem pieces,	58	162	803	0 13 13	7 140 feet	4 15 1	
Square Logs.	23	18	85	0 3 11	40 feet	4 10 3	
Dooos, Doodoos, and Thokes, ..	98	29	204	0 2 1	4 15 feet	6 15 1	
Shinbyins, ..	390	202	164	0 0 6	8 26 feet	0 12 9	
Crooks, ..	14	2	11	0 0 12	6 10 feet	3 14 6	
Small pieces, ..							
Total,....	8,831	6,570	65,782	14 0 7	37' 9"	10 0 2	
Add General Timber Expenses, ..	..	..	31,371	3 9 3	8 10	4 12 4	
Miscellaneous Expenses (Establishment, Contingencies, &c.,) ..	..	..	76,504	2 3 8	10 7	11 10 3	
Grand Total,....	8,831	6,570	173,658	4 0 19	10 7' 37' 9"	20 6 9	
Results of operations in 1856-57, 1857-58 and 1858-59, General Timber Expenses, ..	..	..	369,934	10 6 6	10 0	..	
Miscellaneous Expenses (Establishment, Contingencies, &c.,) ..	..	..	240,546	0 9 4	5 0	..	
Total,....	55,649	..	610,480	11 3 10	15 0	..	

D. BRANDIS,

Superintendent of Forests.

Pegu, Tenasserim and Martaban Provinces.

MYODUIN,  
7th September, 1860. }

## STATEMENT VI.

Statement showing the amount realized on account of the different classes of Timber sold during 1859-60.

Particulars.	Number of Logs.	Cubical contents.	Amount realized.	Average amount realized per Log.	Average cubical contents of Log.	Average amount realized per Ton.	Remarks.
Round Logs.							
Yatts, .. ..	3,711	2,078	22,677	0 6	28 feet.	10 14	7
Loozars, .. ..	1,831	1,093	19,176	0 10	30 feet.	17 7	3
Doogies, .. ..	8,827	7,767	179,405	6 20	41 feet.	23 1	6
Yard, Mast, Keel and Stem pieces, .. ..	123	314	7,456	0 60	11 140 feet.	22 3	8
Doos, Doodoos, and Thokes, .. ..	4	3	48	0 12	0 40 feet.	15 0	0
Shinhyins, .. ..	79	23	757	1 4	9 15 feet.	23 8	2
Crooks, .. ..	611	333	2,326	0 3	13 26 feet.	7 8	3
Small pieces, .. ..	200	40	1,047	11 0	5 10 feet.	26 3	0
Total, .. ..	15,416	11,689	23,3095	0 10 15	1 11 37' 9"	19 15	0
Result of Sales during 1856-57, 1857-58 and 1858-59, .. ..	45,119	28,355	56,3212	1 1 12	7 0 31	19 13	6

D. BRANDIS,  
Superintendent of Forests.  
Pegu, Tenasserim and Martaban Provinces.

Myoduin, }  
7th September, 1860.

## STATEMENT VII.

*Statement of the amount realized for Loozars and Doogies at the different Public Sales at Rangoon in 1856-57, 1857-58, 1858-59 and 1859-60.*

Date of Sales.			Amount realized.			Remarks.			
			Loozars.		Doogies.				
October, 1856,	...	...	17	8	0	26	5	0	
January, 1857,	...	...	12	4	0	16	5	0	
February, "	...	...	3	15	0	15	11	0	
May, "	...	...	5	9	0	10	10	0	
June, "	...	...	7	7	0	20	10	0	
October, "	...	...	11	5	0	0	0	0	
November, "	...	...	13	9	0	19	12	0	
February, 1858,	...	...	7	15	0	16	10	0	
April, "	...	...	5	4	0	0	0	0	
May, "	...	...	6	14	0	15	12	0	
August, "	...	...	0	0	0	33	3	0	
September, "	...	...	19	8	0	0	0	0	
October, "	...	...	21	1	0	30	14	0	
November, "	...	...	31	0	0	49	0	0	
January, 1859,	...	...	23	5	0	41	9	0	
February, "	...	...	22	4	0	28	14	0	
May, "	...	...	11	1	0	23	11	0	
June, "	...	...	0	0	0	23	11	0	
August, "	...	...	11	5	0	23	12	0	
October, "	...	...	13	13	0	27	14	0	
November, "	...	...	9	12	0	21	12	0	
January, 1860,	...	...	10	6	0	17	13	0	
February, "	...	...	15	11	0	17	3	0	
April, "	...	...	19	12	0	30	10	0	

D. BRANDIS,

 RANGOON, }  
 29th May, 1860.

 Supdt. of Forests.  
 Pegu, Tenasserim and Martaban Provinces.

# STATEMENT VIII.

Statement of the Disbursements of the Superintendent of Forests in Pegu, for the year 1859-60.

No.	PARTICULARS.	Rangoon.	Prome.	Toungoo.	Total.
1	By Salary of the Superintendent, .....	12,000	0	0	12,000
2	" Travelling allowance of ditto, .....	1,800	0	0	1,800
3	" Salary of the Deputy Superintendent, .....	6,000	0	0	6,000
4	" Travelling allowance of ditto, .....	625	0	0	625
5	" Travelling allowance of ditto, .....	8,904	0	0	8,904
6	" Salary of Office Establishment, .....	11,982	6,537	0	18,519
7	" Salary of Forest and Timber depot Establishment, .....	2,848	1,089	0	3,937
8	" Contingencies, including travelling allowance of Assistants, .....	0	0	0	0
9	" Girdling trees in the East Sitang Forests, .....	0	0	0	0
10	" Superintendence and contingencies connected with the operations of Girdling, .....	4,633	452	0	5,085
11	" Forest work, 1858-59, .....	0	732	0	732
12	" Prome Teak Plantation, .....	1,119	0	0	1,119
13	" Rangoon Experimental Garden, .....	64,576	1,206	0	65,782
14	" Timber Expenses, amount paid to Contractors, .....	28,788	598	1,984	31,370
15	" General Timber expenses, .....	1,43,278	10,735	19,614	1,73,627
	Total, .....				

D. BRANDIS,  
Supdt. of Forests.  
Pegu, Tenasserim and Martaban Provinces.

RANGOON,  
28th May, 1860. }

MEMO.

Shown in annexed Statement (No. IX.) as disposed of in

1859-60, 15,416 logs, realized Rs., ..... 211,980 15 6

ADD.

Amount due on the above mentioned timber as follows :

20 logs, 1st portion of large sale of 1860,...	520	0	0	
650 ditto, 2nd ditto ditto ditto, .....	6,452	0	0	
597 ditto, small sale of 1860, .....	13,960	0	0	
19 Shinbyins sold at Prome (Private sale),	182	1	4	
				<hr/>
				21,114 1 4

Total amount of sales,..... 233,095 0 10

Memo. of Timber in hand on 30th April, 1860.

At Rangoon,.....	290
At Toungoo,.....	14
At Prome,.....	265
At Kyasoo, .....	262

Total,... 831 logs.

Average value at rates realized in 1859-60, Rs.,..... 13,755 9 0

D. BRANDIS,

*Supdt. of Forests.*

*Pegu, Tenasserim and Martaban Provinces.*

RANGOON, }  
28th May, 1860. }

# STATEMENT IX.

Annual Statement of the nature and amount of Timber Revenue actually collected within the year in each District in the Province of Pegu for the year 1859-60.

No.	PARTICULARS.	Rangoon.	Toungoo.	Prome.	Henza-dah.	Shway-gyeen.	Total amount.
							482 11 8
1	Fines, .....	387 2 10	49 0 0	96 8 10	0 0 0	0 0 0	725 0 0
2	Miscellaneous Revenue.	325 0 0	400 0 0	0 0 0	0 0 0	0 0 0	1,718 8 0
	Permit fees, .....	1,376 0 0	322 8 0	20 0 0	0 0 0	0 0 0	255 0 0
	Salvage on Drift Timber, .....	255 0 0	0 0 0	0 0 0	0 0 0	0 0 0	422 6 0
	Deposit money forfeited, .....	422 6 0	0 0 0	0 0 0	0 0 0	0 0 0	1,293 0 0
	Amount levied for not removing Timber as per conditions of sale at one anna per log per diem, .....	1,293 0 0	0 0 0	0 0 0	0 0 0	0 0 0	290 0 0
	Ground rent (large sales) as per conditions of sale, .....	0 0 0	0 0 0	280 0 0	0 0 0	0 0 0	185 0 0
	For permission to bring away small pieces of Timber from the forests vide para. 4, schedule I. of Forest Rules, .....	0 0 0	0 0 0	185 0 0	0 0 0	0 0 0	64 12 0
	Sale of Timber under para. 3, schedule I. of Forest Rules, .....	64 12 0	0 0 0	0 0 0	0 0 0	0 0 0	96 6 10
	Hire of Elephants for dragging Timber of private parties, .....	30 6 10	66 0 0	0 0 0	0 0 0	0 0 0	0 0 0
	Sale of Dead Elephant Tusks, .....	206,823 8 0	651 0 0	01,691 10 0	0 0 0	0 0 0	0 209,166 2 0
3	Sale of Timber.	1,356 11 6	0 0 0	01,458 2 0	0 0 0	0 0 0	2,814 13 6
	15,247 logs by public auction, .....						
	169 ditto Private sale, .....						
	Total, ... 15,416 Logs.	212,283 15	21,488 8	03,731 4	10 0 0	0 0 0	0 217,503 12 0

D. BRANDIS,  
Superintendent of Forests.  
Pegu, Tenasserim and Martaban Provinces.

RANGOON,  
28th May, 1860. }

# STATEMENT X.

*Comparative Statement of the different Estimates of Revenue realized and of Timber brought down from the Pegu Forests.*

T I M B E R.					R E V E N U E.				
Years.	Estimate of 16th Decem- ber, 1856.	Estimate of 1st August, 1857.	Estimate of 9th Novem- ber, 1859.	Amount of Timber actu- ally brought down.	Years.	Estimate of 16th Decem- ber, 1856.	Estimate of 1st August, 1857.	Estimate of 9th Novem- ber, 1859.	Net amount of Revenue actually rea- lized.
1856-57,	13,000	...	...	22,738	1856-57,	26,979	...	...	Deficit 70,085
1857-58,	21,000	15,633	...	18,117	1857-58,	41,000	Deficit 47,935	...	Deficit 174,492
1858-59,	21,000	15,000	...	14,794	1858-59,	41,000	Profit 89,112	...	Profit 231,640
1859-60,	15,000	35,000	...	8,831	1859-60,	50,000	Profit 209,812	Profit 12,431	Profit 43,845
1860-61,	25,000	45,000	...	...	1860-61,	160,000	Profit 359,812	Profit 168,657	...

MYODUN, }  
7th September, 1960.

D. BRANDIS,  
Superintendent of Forests.  
Pegu, Tenasserim and Martaban Provinces.



# STATEMENT XI.

Tabular Statement of the Permits issued for the working of a portion of the Pegu Forests in 1860.

No.	Name and Residence of Permit holder.	Division.	Name of Forest.	EXTENT OF PERMIT.		RATES.				REMARKS.
				From	To	Full-sized in 4' 6"	Under-sized in 4' 6"	Small pieces in 4' 6" to 3' 6"	Length below 12'.	
1	Moung Shway Moung and Moungtha Youk of Tsanyoral, ...	II. Promé East.	Shwaylay (North), ...	3rd Jan., 60.	1st Jan., 61.	5 0 0	All Round.			Sums paid on account of fees. 0 0 0
2	Moung Teandon of Bassein, ...	III. Bassein.	Nankothoo Khattoo and Kyauk Choungelay, ...	16th July, 59.	1st Jan., 60.	5 0 0	Ditto.			185 0 0 *
3	Moung Tsan Doh Oung of ditto, ...	...	Kyauk Choungelay, ...	16th " "	1st " "	5 0 0	Ditto.			0 0 0
4	Moung Shway Nee of Atoung, ...	...	Nawoon Choung, ...	28th Nov., 59.	29th Nov., 60.	5 0 0	...			0 0 0
5	Aga Ally Akbor of Bassein, ...	...	Nga Pookoh Theegwin, ...	8th Dec., 59.	8th Dec., 60.	5 0 0	...			0 125 0 0
6	Moung Gelay of Shwaygyeen, ...	...	Koon Barloun & Lyyoo, ...	13th Dec., 59.	13th Dec., 60.	8 0 0	4 0 0	0 8 0	0 8 0	...
7	Moung Panyo of Toungoo, ...	V. Sittang Western.	Koon Barloun & Lyyoo, ...	7th Nov., 59.	1st Jan., 61.	8 0 0	4 0 0	0 8 0	0 8 0	0 100 0 0
8	Messrs. J. Mackie and W. Robinson of Rangoon, ...	...	Khaloung, ...	21st Jan., 60.	1st Jan., 61.	8 0 0	4 0 0	0 8 0	0 8 0	25 0 0
9	Moung Shway Moung of Shwaygyeen, ...	VI. Sittang Eastern.	Shwaygyeen, ...	1st Dec., 59.	1st Dec., 60.	8 0 0	4 0 0	0 8 0	0 8 0	50 0 0
10	Moung La Quay of Nadyhit Village, ...	...	Koonoung, ...	8th Dec., 59.	8th Dec., 60.	8 0 0	4 0 0	0 8 0	0 8 0	30 0 0
11	Moung Shway Goung of Youkthawah, ...	...	Youkthawah, ...	3rd Feb., 60.	1st Jan., 61.	8 0 0	1 0 0	0 8 0	0 8 0	50 0 0
12	Moung Panyo of Toungoo, ...	...	Kaance, ...	15th " "	1st " "	8 0 0	4 0 0	0 8 0	0 8 0	100 0 0
13	Moung Tsoun Toungoo, ...	...	Thoukyngiat, ...	2nd April, " "	1st " "	8 0 0	1 0 0	0 8 0	0 8 0	

\* Paid into Bassein Treasury for 39 logs.

D. BRANDIS,  
Superintendent of Forests.  
Pegu, Tenasserim and Martaban Provinces.

Mxodux,  
7th September, 1860.

## STATEMENT XII.

*Statement showing quantity of Timber granted for the erection of Chapels, Schools, Kyoungs, Zayats, Bridges, and other buildings for the common benefit of the public in Pegu from 1857 to 1859, under provision of Para. 5, Schedule I. Forest Rules, dated 1st October, 1859.*

Years.	Rangoon.	Bassein.	Prome.	Henzadah.	Tharrawaddie.	Toungoo.	Total.	Remarks.
1857.	95	...	85	117	119	134	550	The Cubic contents of the Timber granted may be estimated at 25 cubic feet per log. Nearly 780 tons in three years.
1858.	183	80	360	27	156	28	884	
1859.	20	...	56	...	...	94	170	
Total...	298	80	501	144	273	256	1,554	

MYOBUN,  
7th September, 1860.

D. BRANDIS,  
Superintendent of Forests.  
Pegu, Tenasserim and Martaban Provinces.

## STATEMENT XIII.

*Statement showing the amount of Forest Work done in the Pegu Section of the Forests from 1856-57, to 1859-60.*

Years.	Amount expended.	Number of Teak trees girdled.	Number of Teak trees marked to be girdled hereafter.	Number of creepers cut.	Number of Teak seedlings cleared of dry grass and brushwood.	Number of other trees near Teak trees girdled.	Number of seasoned Teak trees lopped.	Remarks.
1856-57.	..	80,877	447,150	28,032	...	...	...	The expenses for the work done in 1856-57, were charged in 1857-58.
1857-58.	39,826 10 11	44,698	...	27,383	...	5,369	...	
1858-59.	9,481 10 0	..	...	7,536	...	14,054	...	
1859-60.	11,982 3 8	13,759	...	10,080	95,344	2,704	399	
Total ..	61,210 8 2	145,234	447,150	73,031	95,344	22,127	399	

MYODUN,  
7th September, 1860.

D. BRANDIS,  
Superintendent of Forests,  
Pegu, Tenasserim and Martaban Provinces.

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## APPENDIX.

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## APPENDIX, No. 1.

## EXTRACT FROM JOURNAL OF A TOUR BY MR. A. S. MACDONALD, OFFICIATING ASSISTANT SUPERINTENDENT OF SITANG FORESTS.

*March 10th, 1860.*—I travelled along the north bank of the Karen Choung in a north-easterly direction, until we came to a Karen village at a point of this stream, where it again takes a south-easterly course north of the village. I found a great many trees, some of which must have been girdled in the Burmese time, as they were in many cases old and decayed: a good many were felled, many of those felled would make good loozars, also some very fine crooks for ship-building, a few of the latter are already cut. Here a good many trees are lying completely covered with leaves and grass, yet they are quite sound. Again on a small height north of a Toungya, I found a large tree lying with root attached; it appears to be quite sound, and an excellent mast piece, near it again lies a very fine doogie, which must also have been cut in the Burmese time. It is quite sound, and had been cut about 8 or 10 feet above the ground. Here I found a few trees girdled by Mr. Clemen in 1858-59, all of which were very good and mostly dry.

(Young Teak.) The young Teak here is the best I have yet seen, very few of them were attacked by creepers, and all that I saw so attacked, I had cut away. Beyond this point I saw no more trees girdled, although I continued my course as far as the foot of the hills beyond the Toungya above alluded to. Near those hills I found some very fine Teak trees but none girdled.


Examined the Karen Choung up to the base of the hills, found it available for floating timber from the last-named place, and above this, timber might be sent adrift in the stream and caught again down below in smooth water. *See note A.*

*11th.*—Sent the Goungway to his village, he being very ill from dysentery and fever.

12th.—Crossed the Karen Choung to the southward, a short distance above the Sitang river. Travelled in a south-easterly and easterly direction, examined a great many Teak trees girdled in 1858-59, most of which were dead, but a few fine Teak trees are still green, owing to the sapwood not having been cut through in the hollow part of the trees, where it was almost impossible to cut through, unless a good portion of the tree had been cut through. This will eventually have to be done before the trees can be killed. South of the Toungya, saw some very good Nathat, also some felled trees from which a few loozars might be cut, also some excellent ship crooks. From the Toungya travelled in an easterly direction for about one mile, and then travelled to the northward, until we arrived at the base of the mountains, (laid down in the Karen boundary map). Here I also saw some very fine Teak but none girdled. Crossed the tail of the hill and again arrived at the Karen Choung, and again mounting the hill we travelled along the ridge in a line parallel to the course of the Choung, but here I saw no Teak, the ground being very rocky; yet some very fine trees of other kinds abound here, being near the north extremity of the hill. We again descended and crossed the creek, and travelled in a westerly direction across the north end of the west hill. At its base saw some very fine Teak trees, and about half a mile further to the westward, saw some very good Teak, girdled in 1858-59, all of which are dead.

16th.—At 7 A. M. left Karen village, for Meedyoung, visiting the

Teak forests as we came along, and on  
Koonoong Forests. the north bank of the Theetnatha

Choung, saw a good many very fine Teak trees, but none were girdled. Many of the trees were very much scorched, owing to a jungle fire which happened to be here a few days previous to this date. At a village north of this Choung, I examined the 12 Teak trees cut and dragged by Ngayoukgyee. Besides these 12 logs, I found two more at this village, one on the bank and the other afloat, both large doogies. The log on the bank was marked with the Koonoong Goungway's stamp, but the one in the river, had only the Burmese mark , I ordered the Goungway to put his forest mark on the logs. To the north of this village, and to the eastward of a large lake I saw a good many trees, girdled in 1858-59, all dead, and at Meedyoung village, a great many trees are girdled, most of which are quite dead.

17th.—This day travelled in an easterly direction towards the hills. Saw many Teak trees girdled in 1858-59, all along the south bank of the Koonoong Choung. In the bed of this Choung I saw a large doogie with root attached, but the top cut off, girth not less than 15 cubits, and length 22 cubits. Examined the Teak forests around Nayat village, saw a great many trees girdled, most of which are dead; also a good many Teak trees felled, the greater portion of which are hollow in the centre. The branches of these trees would make very good crooks, and in many cases very good yatthits; the trunk or hollow part would also make excellent boards; good shingles might also be cut from the vast quantities of waste wood in these forests. Crossed the hill behind Nayat village in a south-easterly direction about two miles in the forest in the valley betwixt these hills. Saw some of the best Teak trees I had yet seen, but none girdled, I suppose owing to the non-existence of dragging roads; yet good roads might be made, with little trouble, down the centre of these valleys, as in many cases the low jungle is the only obstruction. Having crossed a range of high hills we now travelled in a more southerly direction, and in all the valleys or on the slopes of the hills, saw some fine Teak trees, but none girdled, and less Nathat than I have yet seen. Again travelling in a south-westerly direction, crossed some more high hills, we came upon some very good dragging roads, and a great many Teak trees were girdled along both sides of these roads, most of which were dead, a few Nathat, and a good many felled, also some lying on the ground with root attached. The whole of this forest, as far as I have gone, has been burned by fire this season, the trees standing are not damaged, but those previously felled and some of the Nathat are completely burned.

20th.—Examined 39 trees of various kinds girdled near the village, and on the bank of the Showay-doyah Forest (Koonoong district). Showaydoyah Choung, the whole of which are easy of access, and can be dragged with very little difficulty; the timber is very small, yet they are of better shape than those examined by me on Saturday.

Regarding the Teak Forests in this locality, I saw some very fine teak trees about a quarter of a mile north of this village: they were about 3 cubits in girth, and from 30 to 35 to the first branch in length, and in many cases they even exceeded this length: there are not many



full grown Teak trees here, yet where they are, they are very large, and would make excellent mast pieces, a little further north on the bank of a lake there are a great many fine mast pieces, standing in groups of six or eight together. It is a very great pity that some of these had not been girdled, as I have not as yet seen any of the same quality in these forests. They are long and straight and to all appearances quite sound, and not damaged by fire, like those in other parts of this forest which I have seen.

Again on the bank of the Showaydoyah Choung there are some splendid Teak trees, which in many cases have only to be cut and rolled down the hill into the stream, yet none of them are girdled. A great many Teak trees which had been felled in the Burmese time, are lying throughout the whole of this forest, some are very good mast pieces, yard pieces, &c. &c., in some cases they are lying not 30 yards from the water, yet they have been left by the contractors of previous years, for which I cannot give a reason.

I am told Mr. Clemen did not visit this part of the forest last year owing to the rains setting in while he was girdling on Koonoong Choung.

21st.—This day examined 44 trees of various kinds girdled by the Koonoong Goungway to the eastward of Yeadah Shoey village, on the banks of the Showaydoya Choung, all very small but of good shape. Regarding the Teak trees in this part of the forests, there are a great many fine seedlings from one to three years old, also a great many fine young Teak trees from one to three cubits in girth, the ground whereon these trees are growing, are small rocky hills with but very little soil, but what there is, is a light brown soil. I believe the rocks are granite. This part of the forest is quite clear from low jungle. There are also a great many very fine full grown Teak trees here, but none girdled. Saw a great many fine Teak trees lying on the ground, some cut up into lengths as doogies, loozars, and yatthits. The Koonoong Goungway states that there are over 300 Teak trees lying on the ground in his forest, but if I am to judge from what I have seen I should say there are over 600. If there are so many felled near to the stream where they might be brought to and floated in five minutes time, what is likely to be the number throughout the other part of the forest?

I do not suppose that the permit holders will be able to clear

away more than one half of the timber already felled in this forest, this season. It is a very great pity that European enterprize could not be introduced into these forests, as it is evident that the Burmese cannot or will not work them to any advantage.

22nd.—Arrived at Gwaythay village, and proceeded to inspect that part of the forest nearest to the Gwaythay Forest. Choung, and north-east of the village.

Here I saw a very fine young Teak plantation. The plants look very healthy, I think that some of them might be removed to advantage, and transplanted in the forests near to this place. Again, proceeding in a more easterly direction, I came upon another plantation even better than the last: a good many fine young plants are attacked by creepers.

I also found a good many trees felled here, some of which are cut into lengths of doogies, yattlits, and loozars. I also saw a good many trees girdled, but it must have been a long time since, as the mark of the axe is almost effaced from the tree. N. N. E. of this village is an old Kyoung, and over it are scattered a great number of Teak trees of all sizes, all of which are either girdled or Nathat, many of them have stood so long in this state that they are nearly consumed by the annual fires which take place every dry season. Many of these trees are also felled, so we may look for the whole to be consumed by those fires next dry season (1861). Ashes mark the spot where a good many of them had been consumed this season, both here and in the forests. It is very strange that these trees should have been left by contractors of former years, as they are on the very bank of the Gwaythay Choung.

Throughout this part of the forest, there is a large quantity of old branches, which would make very good ship crooks: they might also be used for many other purposes.

23rd.—This day proceeded in an easterly direction through the young Teak plantation mentioned in yesterday's report, and about four miles east of this village, and one mile south of the Choung of that name, I found some very fine Teak trees in groups of 10 and 12, and not one of these trees was under the size of a mast piece. The greater portion were from 50 to 60 cubits to the 1st branch, in fact some of these trees might be cut 100 to 120 feet, quite sound and straight.

The trees in this forest, very unlike those girdled of the lower forests, are round and of a good shape, while the latter are in many cases bad, being burned with fire, crooked, or branching off too soon, leaving but a short trunk or main stem.

It is a great pity that none of these trees have been girdled, as they are so close to the water, in fact many of them might be felled on the top or slope of the hill, and rolled into the stream without any difficulty.

The soil upon which these fine trees grow is a light brown mould, intermixed with fragments of small white stones. It is very strange that not one young Teak plant or tree is to be found over the whole of this space, where the trees are so large. I do not believe that there is a single tree under the size of a yard piece.

I think that it would be advisable to transplant some of the young plants from the last mentioned plantation (now requiring thinning) to this place, as the soil is rich, and it is evident from the size and beauty of the trees it now bears, that a more suitable place could not be found, it being also near to the Gwaythay Choung.

About six miles to the eastward we now proceeded in a northerly

Bymbiay Forest.

direction and crossed the Choung into the Bymbiay Forest, and again proceeding

in a northwesterly direction, through the last named forest, I saw many good Teak trees, though not to be compared with those south of this stream, the soil here being rocky, yet the trees are of excellent shape, but of all sizes and ages, from one year upwards.

*Nathat.*—Throughout the whole of my journey this day, I saw but few *Nathat* in the Gwaythay Forest, but a great many in the Bymbiay Forest. I do not know how this is to be accounted for, unless it is the rocky nature of the Bymbiay Forest, by which the soil is more apt to be washed away, than that of the other, thereby exposing the roots to a greater degree of heat and drought than the other forest.

Of trees fallen with roots attached, I found a good many in both forests, most of which were very good timber.

*Felled Timber.*—In the Gwaythay Forest, I saw a great many very fine sound Teak trees felled and cut into lengths, very often into two, say one doogie, and one loozar, and in some cases a third division, one yathit; these trees would have made excellent mast pieces. This timber was cut last year, so it cannot be put down to the bad manage-

ment of the Burmese times, but to the carelessness of the Goungway, who ought to look after the contractor, and see that he cuts the trees to the best advantage for the Department.

(A true extract,)

D. BRANDIS,  
*Superintendent of Forests,  
Pegu, Tenasserim and Malacca Provinces.*

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### EXTRACT FROM NOTES ON THE FOREGOING REPORT.

*Note A.* The base of this hill would be an excellent place for the erection of a water saw-mill, which might be put up at very little expense. As most of the machinery is made of wood, the water-wheel, &c. &c., could be made on the spot. All that would require to be brought up, would be the multiplying power, say one large cast iron wheel, one small ditto, commonly known by the name of pinion, and a few iron gudgeons (say 4) with the same number of brass or bellmetal bushes, (the latter could almost be dispensed with, as good hard wood for that purpose is to be found in the forests,—beech is usually used at home), some bolts and nails, circular saws with their iron axes, all this could be put together by any common workman, without the assistance or expense of an engineer, which is necessary for the erection of steam mills, and also for their working, after they are erected. The use of such a mill would be to square large logs, convert the slabs into boards or shingles for the roofing of houses, saw up logs into scantlings, &c. &c. This would be an immense saving to Government. I will only refer the Superintendent of Forests to one instance.

During the time I was stationary at Tounghoo, the Ex-engineer of that place was erecting very large commissariat buildings for the Government, the whole of which have been roofed with shingles brought from Rangoon and Maulmain. Those from Rangoon had first to be sent to Pegu in boats, and there landed; from Pegu they had to be carted across to Kyasoe, and again put on board of a boat for transport to Tounghoo.

(A true extract,)

D. BRANDIS,  
*Superintendent of Forests,  
Pegu, Tenasserim and Malacca Provinces.*

## APPENDIX, No. 2.

EXTRACT FROM CIRCULAR No. 4, DATED RANGOON, THE  
2ND NOVEMBER, 1858.

I. The following Teak trees are to be girdled :—

1.—All good and straight trees that are attacked by parasitic ficus, or are beginning to be hollow or show other signs of decay.

2.—All good and straight trees in girth above 8' 3" ( $5\frac{1}{2}$  cubits) ; the girth to be measured at a height of 6' (4 cubits) from the ground. If the tree is forked, the girth must be measured above the fork.

II. The following trees are not to be girdled :—

1.—Trees that cannot be brought away.

2.—Trees that are useless, i. e. that will yield neither good logs nor crooks.

3.—Trees standing alone or so far from others, that by taking them away the ground around them would be deprived of seedlings.

4.—Trees standing in a deserted Toungya or on the margin of the same.

III. The work must be done in the following manner :—

1.—The tree must be girdled completely, so that it cannot live, and the cut must every where go 4 inches deep into the wood.

2.—Creepers must be cut away from all Teak trees met with by the coolies, whether large or small, and the lower part of the creeper must be removed, so as to prevent danger from fires.

3.—All dry branches, pieces of wood and bamboos must be removed from the trees girdled, so as to prevent their being injured by fire.

D. BRANDIS,

*Superintendent of Forests.*

*Pegu, Tenasserim and Martaban Provinces.*

ပဲကူးဝိုင်း

ကံနို့ သစ်တောတွင်၁၈၆၀၀၀  
နေထိုင်ရောက်အောင်၊ သစ်များ

၂၆၁၇၇၇၇၇

Offg. Asst. Supdt. of Siting Forest.

(Sd.) A. S. MACDONALD,

{ နံ့ခွံလဲ  
{ နံ့ခွံလဲ

[illegible][illegible]

ပဒိဝါ                      ။ ခုနင်းသံဃာတော် ။ ပုဂံဇော

ပဒိ၁ ၊ ။ ချမ်းမြေ့စွာလေ။ သံဃ

၆၆၁ ။ ဇာလ်လူဝါဒ်လူဝါဒ်လူဝါဒ်လူဝါဒ်လူဝါဒ်

နှင်းတနင်းသာရီမုတ္တမသိုင်းသစ်တောရုံးတော်က။

ဒုဝေဝါရီလာ၅ရက်နေ့ကစ၍။ ထနှစ်အတွင်း။ ဘဂဇ္ဈေဇ္ဇာဝဝါရီလာရက်  
 ၁၇။ ခုတ်လုပ်စေခြင်း၌။ ပေးသည်အခွင့်စာ။

၃၄သစ်တော၏နယ်ပါယ်အပိုင်းအချား။

ဒေသံ။ သစ်နုသာချောင်စပ်ကျာရေဝေကျာတိ။

သေဝ်။ ပုသိချောင်စပ်ကျာရေဝေတိ။

သေဝ်။ တောင်တန့်ကြိတ်တိ။

သေဝ်။ စစ်တောင်ပြစ်တိ။

ညှိ။ လုပ်ကိုင်ပိုင်သောအခွင့်လက်မှတ်စာအတွက်။ ဒက်ပျာရေ၅ဝိပေး

အခွင့်လက်မှတ် ပေးသည်အချက်။

သစ်ခေါင်း မောင်ပန်ညှိပိကျိ။ ကန့်သစ်တောကကျွန်းသစ်ချောက်ဟော  
 ပည။ သို့သော်လည်း။ ဘဂဇ္ဈေဇ္ဇာဝဝါရီလာရက် ၁၇။ ခုတ်လုပ်စေခြင်း၌။ ပေးသည်အခွင့်စာ။

သည်။ တနင်္ဂနွေအတွက်တသာရသည်ဖြစ်၍။ ဘဂဇ္ဈေဇ္ဇာဝဝါရီလာရက် ၁၇။ ခုတ်လုပ်စေခြင်း၌။ ပေးသည်အခွင့်စာ။  
 သစ်တောဥပဒေအ  
 မလုပ်မကိုင်လျှင်။ သစ်တောဝန်ကြီးမင်းဖြစ်စေ။ တောင်ရမြစ်သစ်တော  
 အခွင့်လက်မှတ်စာကို။ မည်သည်နေ့ရက်မဆို။ ပြန်၍နှုတ်သိမ်းနိုင်သည်။  
 သစ်တောရုံးတော်သို့။ ပေးပြီးငွေကိုလည်း။ ပြန်၍ပေးတော်မမူ။

သေဝ်။ ဟော၍။ ရွှေကျင်မြို့သို့ချယူခဲ့ရမည်။ ၎င်းသစ်များကို။ မိမိလိုရာ  
 ခွင့်မရခင်။ အောက်တွင်ပါရှိသည်ဈေးနှုန်းအတိုင်း။ အကောက်တွက်ငွေ

၁၃တောင်အထက်။ သစ်တလုံလျှင်။

ငွေဝိ

## APPENDIX, No. 4.

## RULES FOR THE ADMINISTRATION OF FORESTS IN THE PROVINCE OF PEGU.

1. The Forests of the Province of Pegu being the property of Government, the following Rules are published for their administration.

Forest Rules, their object.

Officers appointed to carry out these Rules.

II. The Officers appointed for the administration of the Forests, are

1. The Superintendent,

2. His Assistants, viz. : The Deputy and Assistant Superintendents, and the Forest Assistants,

3. The subordinate Officers, viz. : Goungs, Goung-gwais, and peons, both in the Forests, and at the Timber Stations.

III. No person is permitted, without orders from the Superintendent or his Assistants, to mark, girdle, or fell any Teak trees, large or small, to cut, or break off branches from Teak trees, or otherwise to injure them.

Teak trees, how protected.

IV. The felling and dragging of timber must be done in such a manner as not to break or injure any Teak trees. Owners of elephants are responsible for any injury done by their animals.

Precaution to be taken in the felling and dragging of timber.

V. No Teak timber, which is subject to the control of the Forest Department, or found adrift in the creeks and rivers of the country, shall be marked, neither shall any mark on it be effaced. It shall not be converted, cut into pieces; not burnt, neither shall it be concealed, removed nor disposed of by sale or otherwise, without orders from the Superintendent of Forests or his Assistants. And any Teak timber found in the Province of Pegu, that may appear to the Superintendent of Forests or to his Assistants to have been obtained in a manner contrary to the Forest Rules, whether entire, or cut up, or sawn up, such Teak timber may be confiscated by orders of any of the above Officers.

Teak timber how protected.



VI. No *Toungya* is to be formed on any spot of ground on which the number of Teak trees exceeds fifty, large or small, (seedlings included); but in special cases, the Superintendent or his Assistants may grant permission for *Toungyas* to be formed in spots where it appears to them that the Teak cannot be made available for the use of the Forest Department.

VII. Should *Nathat*, or seasoned Teak trees, or Teak timber be found in a place selected for a *Toungya* or hill plantation, the men who intend working the *Toungya* must, before setting fire to it, clear the ground around such trees or logs ten cubits round the same, so as to prevent the fire from injuring them. They must report their having done so to the Forest *Goung-gwai* of their district, when he visits their village on his tours through the Forest.

VIII. All trees, (except Teak,) as well as bamboos, are free, and no person may levy duty on the same, except by express orders from the Superintendent; but whenever the Superintendent or his Assistants may find it necessary to mark trees of any kind, or to girdle them, such trees shall neither be injured, felled, nor removed without permission.

IX. Nurseries or plantations formed by order of the Superintendent or his Assistants, are not to be injured in any way.

X. Whenever the Superintendent or his Assistants may think it fit to reserve any tract in the Forests, no tree, shrub, or dead timber in the said tract is to be injured, felled or removed except by orders from these Officers. No tract of a size exceeding ten acres is to be thus reserved, without the special sanction of the Commissioner.

XI. Poles or other signs put up to mark the boundary of a reserved tract, or for other purposes; likewise sheds, bridges, fences or buildings of any kind; together with roads and ditches erected or made by orders of the Superintendent, are not to be removed or injured in any way.

XII. The disposal of timber from the Pegu forests either by Government Teak timber, how to be sale, or gratuitously for the common disposed of. public benefit, will take place according to the regulations of Schedule I.

XIII. All timber disposed of by the Forest Department, will Marks and passes for Government timber when sold. be stamped with such mark or marks as the Superintendent of Forests may direct, and the purchasers or grantees will, on application, receive a pass in the form exhibited in Schedule V., which will enable them to move their timber about without molestation.

XIV. Parties in charge of Government timber who lose the Loss of Government timber, liabilities for the same. same, or allow it to be lost or destroyed, render themselves liable to punishment, unless they shew that the loss arose from causes not under their control.

XV. Foreign Teak timber when brought within the British Foreign timber arriving within British territory. territory on the Northern frontier, will, until further notice, pay duty to the Collector of Customs at the rates noted in Schedule II. Such timber will, after duty is adjusted, receive a pass from the Collector of Customs in the form exhibited in Schedule III., and every log or piece will be marked with the duty mark.

XVI. At the Toungoo Custom-house such timber only will be Timber brought into the British territory by the Sitang river to be reported to Goung on the frontier. recognized as Foreign as has been duly reported to the Goung stationed at the frontier by the Forest Department. The Goung will mark every log with his stamp, and grant a certificate in the form annexed in Schedule IV. Logs found below the frontier on which the stamps are wanting, or which are in excess of the certificate, will be liable to be confiscated and sold on account of Government.

XVII. Should any timber brought from beyond the British Foreign timber if sold before reaching a sea-port, mode of procedure. frontier be sold before reaching a sea-port, or should its destination be changed, application must be made to the nearest Assistant in the Forest Department to have the transaction endorsed on the back of the pass.

XVIII. Timber brought to Rangoon will be examined at such river stations as are named in Schedule VI., or as may be hereafter notified. No rafts shall leave or pass these stations without an order from the office of the Forest Department at Rangoon.

XIX. All timber found in transit without a pass as hereinbefore provided, and without the marks of the Customs or Forest Department according to provisions of Rules XIII. XV. and XVI., will be liable to confiscation.

XX. All drift Teak timber found within the Province of Pegu, and in the Sitang river, will be considered as the property of Government, unless proof of the contrary be given.

XXI. It is the duty of the village Goungs, peons, and headmen near the rivers and creeks of the country to afford all the assistance in their power to rafts of Government timber that may be in danger, and to secure drift timber as far as possible.

XXII. Scales of salvage for the different portions of the country will be established by the Superintendent, subject to the approval of the Commissioner. These scales will be published and hung up in the office of the Superintendent, of every Assistant, and of every village Goung near the rivers and creeks of the country.

XXIII. Parties who have saved Teak timber are bound to deliver the same on receipt of salvage money to such persons as are authorized by the Superintendent or his Assistants to collect drift timber, when, in addition to the amount of salvage, such expenses as may of necessity have been incurred on the timber, will be paid. Such parties may also themselves bring the timber to any of the Government depôts, in which case they will be paid for so doing.

XXIV. At the Government Timber depôts of Rangoon, Prome, and Toungoo, or at such other stations as it may hereafter appear expedient, notices shall be published on

the last day of every month, stating the number and description of logs of such drift timber brought in during the month as bears the marks mentioned in Rules XIII. XV. and XVI.

XXV. Two months' notice will be given for the reception of claims to the ownership of drift timber at the office from which the notice mentioned in Rule XXIV. was issued, after which, no claimant appearing, the timber will be sold on account of Government.

XXVI. All such claims will be decided by the Superintendent of Forests, or such Assistants as he may authorize so to do, provided, however, that the Superintendent or such Assistants shall be at liberty to decline arbitrating regarding any such timber in cases where they may see fit so to do, and refer claimants to the Civil Courts.

XXVII. Timber awarded to claimants must be redeemed by payment of the rates noted in Schedule VII., or of such as may hereafter be notified.

XXVIII. Parties who are under engagement on account of Government for work in the Forests, or for the dragging and floating of Government timber, or for the bringing in of drift timber; or Officers of the Forest Department who employ coolies for these purposes and withhold just payment for work done by their workmen, and who may not adjust the salvage due on drift timber are liable to punishment under these Rules.

XXIX. It is the duty of the Forest Goungs, Goung-gwais and peons of the Department to see that these Rules are not violated, and should they in any case be infringed, to report the same without delay to the Superintendent or his Assistants.

XXX. Any person who infringes any provision of the Forest Rules, or any subordinate of the Forest Department who wilfully neglects his duty, will be liable to imprisonment without labour for a term not exceeding six months, or to a fine not exceeding two hundred rupees, commutable if not paid, to imprisonment for a term not ex-

ceeding six months without labour. In cases where the infringement involves fraud, or theft of timber, the offender will be liable to be proceeded against in the criminal court.

XXXI. All cases of violation of these Rules may be tried and decided by the Superintendent of Forests, either by personal enquiry into the facts, or on the record of enquiry made by a Forest Assistant; in any case the decision and the grounds for it shall be recorded, and the same will be open to appeal to the Commissioner.

XXXII. Whenever a person has been sentenced to imprisonment by the Superintendent of Forests, the person so sentenced shall be forwarded without delay to the Officer in charge of the district within which the offence was committed, together with a copy of the sentence, and the said Officer shall forthwith proceed to execute it.

XXXIII. The Commissioner may authorize any Assistant of the Forest Department to exercise the same powers as those vested in the Superintendent, either wholly or only with regard to certain of these Rules.

XXXIV. All decisions of Assistants made under these Rules may be revised by the Superintendent.

XXXV. In conducting trials regarding the violation of Forest Rules, the Officers of the Forest Department will be guided by Rules IX. to XVII. of the Rules for the Administration of Criminal Justice in the Province of Pegu, and the Superintendent and those Assistants who may be empowered so to do, will exercise the powers vested by those Rules in the Judicial Officers of the Province.

## SCHEDULE I.

*Exhibiting the Rules under which Government timber in the Province of Pegu may be disposed of.*

1. By auction sales at Rangoon and other stations. The periodical auction sales will be of two classes:

## (A.) LARGE SALES. (B.) SMALL SALES.

(A.) There will be but one large sale per annum (held at Rangoon,) which may, however, be divided into different portions, at the discretion of the Superintendent.

(B.) Smaller sales will be held from time to time during the year at Rangoon, Prome, and other timber stations.

At all public sales one portion of the payment (not less than 10 per cent. on the amount,) is to be made on the day of sale, either in cash, public securities, or promissory notes, and the balance within a term not exceeding 3 months after the day of sale. No timber to be delivered before payment in full shall have been received, but the timber to be at the risk of the purchaser from the moment it is knocked down.

2. At Rangoon, and other stations, no timber will be disposed

Private sales at Rangoon and other stations. of by private sale to the public departments, or to private parties, except by order of the Commissioner, or, in his absence from Rangoon, of the Deputy Commissioner. The indents for such timber must first be sent to the Superintendent of Forests, who will forward the same with his recommendation, or otherwise, to the Commissioner, for his orders thereon. No timber that has already been advertized for auction is to be disposed of in this manner. At other stations such sales may be effected at the discretion of the Superintendent, but for sales to private parties the sanction of the Chief Civil Officer of the Station must first be obtained.

Private sales shall not be effected at rates below those realized at the last public sales, unless by special order from the Superintendent.

No private sale, whether to private parties, or public departments, is to be considered as concluded, and no timber is to be delivered on account of the same, unless the full amount of the purchase money in cash or treasury receipts, is paid into the office where the sale was concluded.

3. Whenever the Superintendent may think it advisable, he may

Sale of seasoned timber in the forests. dispose of the seasoned Teak timber standing, or lying in a certain forest tract, or of a portion of the said timber for purposes of the Forest Department, or by sale to public departments, or to private parties.

The purchasers will remove the timber within a fixed time, and a portion of the purchase money will be paid in advance. Timber remaining in the forest after the time fixed, will revert to Government, and any amount paid in advance on account of the same will then be forfeited.

4. Permission to bring away branches of felled trees, or other

Sale of small pieces of timber in the forests. small pieces of timber, such as slabs cut off from squared logs, or the stumps

remaining after the tree has been felled, will be given for a limited number of months to parties applying for the same, on their depositing a certain sum as a security, and on payment of a certain amount per month, in one Forest District. In case the parties bring away, cut up, or otherwise destroy any timber besides that stipulated for, the grant as well as the deposit will be forfeited, and the parties will be liable to punishment.

5. Parties residing in the district near the forests, and at a

Grant of timber for the common benefit of the public. distance from the principal rivers, who may be desirous of obtaining Teak

timber for the erection of buildings for the common benefit of the public, as Christian churches or chapels, schools, kyoungs, zayats, bridges, &c., may apply for the same to the Superintendent or his Assistants, or the application may be made through the Deputy Commissioner in charge of the district, who, in case he may find it advisable to recommend the application, will forward the same to the Superintendent of Forests. Final orders regarding such applications granting timber for these purposes, or otherwise, will be issued by the Superintendent of Forests, or by such Assistants as he may specially empower so to do. Timber granted under this rule will be pointed out to the grantees, by the Forest Goung-gwais. The grantees must fell, and remove the same to the place where the timber is to be used, within a fixed time.

Timber, for these purposes, will be given gratuitously, but on the expiration of a year from the time of the timber being granted to the parties, an account will be called for by the Superintendent or his Assistants, shewing how it has been used. Should it not have been expended for the purposes specified in the application, the timber will revert to Government, and the parties who received the grant, will, if they should have applied the timber to other purposes, be liable to punishment.

## SCHEDULE II.

*Exhibiting the rates for the collection of Revenue on foreign Teak timber, when brought within the British territory on the Northern Frontier.*

1. The rate of duty on all logs, round or squared, is,..... 2 12 0 per log
2. Planks 1 inch thick and below, ..... 0 3 0 „ piece.  
     do. 2 do. do., ..... 0 6 0 „ „  
     do. 3 do. do., ..... 0 9 0 „ „  
     do. for every inch of thickness above three inches, three

annas more.

3. The produce of branches will be passed at the following rates :

Stem pieces, .....	0	9	0	per piece.
Ship Crooks, .....	0	4	0	„ „
Boat Crooks, .....	0	1	0	„ „
Small do., .....	0	0	6	„ „



**SCHEDULE III.**

**SCHEDULE III.**  
*Form of Pass for Foreign Timber imported into the British Territory.*

[illegible]

**SCHEDULE IV.**  
*Form of Certificate to be given by the Frontier Guard above Tongoo.*

No.	Date.	Owner or Consignee.	Name of Head Draftsman.	Description of Timber.	Timber Mark.	No. of Logs or pieces.	TOTAL.	REMARKS.



# SCHEDULE VI.

Names of River Stations at Rangoon, where all private Timber will have to stop to be examined.

## Stations.

Timber arriving from the Sitang river,	At the mouth of the Puzoon-doung Creek.
Timber arriving from the Irrawaddy river,	At the mouth of the Tsanchoung below Kemendine.

# SCHEDULE VII.

*Exhibiting the rates which will be charged at the different Government Timber Stations for salvage, watching and bringing in of Drift Timber awarded to claimants.*

1. For Timber brought in from any part of the Sitang river above Kayassoo.

At Toungoo and other Stations on the

Sitang, ..... 2 8 0 per log.

At Rangoon, ..... 5 0 0 „

2. For Timber brought in from any part of the Irrawaddy River and the Creeks of the Delta.

At Prome and other Stations on the Irrawaddy river, .....

1 0 0 per log.

At Rangoon and Bassein, ..... 2 0 0 „

3. For Timber brought in from the sea shore, no rates can be fixed, but the expenses incurred in saving, rafting, watching and bringing in of the Timber will be charged.

By order of the Commissioner of Pegu and Agent to the Governor General.

(Signed) D. BRANDIS,

*Supdt. of Forests,*

*Pegu, Tenasserim & Malayan Provinces.*

RANGOON,

The 1st October, 1859. }

No. 82 D.

TO MAJOR A. P. PHAYRE, COMMISSIONER OF PEGU, AND  
AGENT TO THE GOVERNOR-GENERAL, RANGOON.

SIR,

I beg to draw your attention to my letter, No. 233-B, dated 29th April, 1858, regarding the removal of certain obstructions in the different water-courses, which, if cleared, would afford channels for the floating of timber from such portions of the Forests as have not been worked before and are consequently rich in valuable timber.

2. In that letter, I brought to your notice particularly those obstructions that were increased or liable to be increased through the establishment of fisheries. This difficulty has been removed by your ordering that such water-courses as are required for the floating of timber should not be let out for fisheries.

This class of obstructions is mostly in the plains; but other classes, to which I would now draw your attention, occur in the hills.

3. You are aware that a very remarkable feature in the geological character of the hills between the Sitang and the Irrawaddy, where the Teak forests are richest and easiest of access, is the system of parallel ridges, running almost always from North North-West to South South-East, with a deviation from the north varying from 0° to 45°, consequently most streams in the upper portion of their course find their way through the natural valleys between these longitudinal ridges. But since, on account of the meridional direction of the main valleys, all tributaries of the Irrawaddy, Hlino, Sitang and Pegu rivers must assume a general easterly or westerly direction,

the streams frequently have to break through the lines of elevation more than once, in right or oblique angles. The effects of these

\* Kyouktaga :  
ကျောက်တံခါး  
or  
Kyoukmyoung.  
ကျောက်မျှောင်  
† Kyouk Kadin.  
ကျောက်ခံတင်  
‡ Kyoukloongyi.  
ကျောက်လွှဲကြီး

branches are either narrow channels\* cut out deep in the rock ; or water-falls,† the stream leaping over the strata of rock, which it could not break through ; or lastly the remains of the violent commotion are left in the bed of the torrent in the shape of large boulders, more or less obstructing the passage.‡

4. In a few instances, the cause of these obstructions is of a far more complicated nature. Thus the famous Kyouktaga of the Pegu river, which has hitherto protected many square miles of the most splendid Teak forest, is at a spot where the general direction of the strata changes from 15° west of north to 15° east of north ; and the stratification of the rocks near the Kyoukloongyi in the Thoungzay Choung shows a similar irregularity. But the further explanation of this latter class of obstructions would lead into questions of a purely scientific nature.

5. Suffice it therefore to observe, that almost every Choung and most of their tributaries are, at particular places, more or less obstructed in their course through the hills.

It is true that some of these obstructions offer no essential obstacle to the floating of timber, and that in others the difficulties in floating may be avoided by a skilful management, men being placed on the banks to guide the logs with poles and bamboos, and thus to prevent their being squeezed in between the rocks or split by the shock against them, or use is made of the few days, often hours only, of very high floods in these torrents, which occasionally cover the rocks that form the obstruction.

But a large proportion are altogether impracticable, and thus the number of localities from which Teak can be made available is but small in proportion to the extensive tracts covered with Teak forests in the hills.

6. I have hitherto only mentioned the central part of the country as offering these difficulties. But both the western Yomah (towards Arracan) and the hills east of the Sitang present similar obstructions.

The Teak on a large extent of hilly country along the Shoaygyeen river is at present unavailable, on account of the rocks in the upper part of the Choung, and one of the main branches of the Padashin Choung, (the Jadawa Choung,) which joins the Irrawaddy near Kyangyin, and is said to have fine Teak near its upper course, is obstructed by a Kyouktaga, not more than one day's march from the Irrawaddy.

7. These difficulties can only be removed by a series of blasting operations, which probably will have to be continued for a number of years. Some of the operations may be completed within a few days, others are likely to take months. A description of two of these obstructions is attached.

The easiest mode of accomplishing this, appears to be to attach a party of Sappers and Miners to the Forest Department for the working season from December to June, and I should think that the

\* 1 Havildar.  
1 Baigne.  
12 Privates.

strength noted in the margin\* would be sufficient. They should always be employed in that part of the forests

where the work of girdling is being conducted, and where consequently a number of assistants and frequently the Superintendent himself will be employed for the whole season in districts of limited extent, and where accordingly greater facilities will be given for exercising an effective superintendence, and for the conveyance of stores required for the operation of blasting.

8. The expenses that would be caused by these operations would not be considerable, beyond the pay of the party and of an equal number of coolies, that should be attached to them to do the rough part of the work (erection of scaffoldings, huts, conveyance of stores, where elephants cannot be employed, &c.).

All extra expenses are of such a nature that they might be charged off in the monthly contingent bills, or a separate bill might be submitted together with a report on the work done, but I do not think that it would be practicable to submit regular estimates for this kind of work, nor do I see how a superintendence of it could be effected, if it were to be undertaken by the Department of Public Works. It would not be worth while to place an executive officer in charge of it, and the distance of the different obstructions from any station is so great, and the difficulties of access so considerable, that the work could not well be superintended by one of the Executive Engineers in charge of a division in the province.

9. In conclusion, I beg to observe, that it may be possible gradually to train a number of natives of this country to the work, by first employing them as coolies with the working party. If this succeeded, a small body of Burmese (or Karen) sappers and miners might be organized by the Forest Department, and while employed in clearing away the numerous obstructions of Choungs in the hills and in the plains, they would, at the same time, serve as a Forest Guard, the formation of which will soon become a matter of necessity on account of the great difficulty experienced in keeping parties from other corps (Burmese or natives) in good health and spirits while employed in the Forests, which difficulty can only be avoided by forming a party exclusively for the purpose.

10. If it were possible at once to obtain a party of Sappers and Miners, the operations might be commenced in the impending dry season.

I have, &c., &c.

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu and Tenasserim.*

RANGOON,

*The 9th November, 1858.*

## DESCRIPTION OF THE WASOE KADIN.

The Wasoe Choung is one of the main branches of Pounplin river, coming from the hills between the Pounplin itself and the Mahoojah stream, thus forming, as it were, the central branch of the whole.

About two good marches to the north of Phoungyeemyo is the deserted village of Wasoe Jova, and the obstruction is about three miles higher up the stream: the Choung has broken through the strata of hard sandstone which shews the usual stratification, viz. from N. W. to S. E. the inclination being towards west at about 45°.

The obstruction itself consists in a narrow passage of 9' wide. The length of this passage is only 8 feet, but it is almost impossible to float good-sized logs through, because there are a few smaller rocks above the narrow part, and because the bed of the Choung is winding before and after it passes this gate of rock.



In the Burmese time, short and small pieces were frequently brought through; but many remained in the passage, obstructing it the more. There are now 15 logs, loozars and yatthits between the rocks, and frequently it has been necessary to destroy by fire those that had collected, in order to clear the passage to a certain degree.

Further down, the Choung passes over one of those rapids which are so frequent in Burmah, viz. a succession of steps formed by the strata of the sandstone inclined against the course of the Choung. But as the bed is wide here, these rapids present no impediment to the floating of logs. The principal difficulty in this obstruction might be removed by blasting the rock (*a*) to the north of the narrow.

This rock is of an irregular prismatic shape, and has the following dimensions :

Height above the level of the water	
in March, from .....	20' to 14'
Breadth from .....	18' to 8'
Length (which would require to be removed,) .....	20'.

The cubical contents therefore are

$$\begin{aligned}
 h &= \frac{20 + 14}{2} = 17' & \text{cubical contents.} \\
 b &= \frac{18 + 8}{2} = 13' & \frac{17 \times 13 \times 20}{2} = 2210 \text{ cubic feet.} \\
 l &= 20'
 \end{aligned}$$

The opening of this obstruction would render available the whole of the forests above the same, which extend to the ridges of the Yomah, and are very rich in fine timber.

Elephants and buffaloes can be brought up by a path across the mountains to these forests, above the obstruction.

The distance from the obstruction to the Yomah is said to be 8 miles, which probably is an exaggerated statement.

## DESCRIPTION OF THE KYOUKLOONGYI IN THE THOUNGZAY CHOUNG.

The Thoungzay Choung joins the Hline river at Tsangonay, and rises from the western slopes of the Pegu Yomah about 30 miles north east of that town.





The main stream is remarkably free from obstructions. The only real difficulty which timber meets in its transit from the hills to the plains, are the detached rocks, which are found between the mouth of the Kodonay Choung and Way village, about 2 miles above the latter place, and 16 miles from Tsangonay.

The Kajinbyoo ridge runs in h. 1. ( $15^{\circ}$  W. of N.) quite in accordance with the stratification of the rocks. The bed of the Choung is thus—



and, similar to numerous beds of smaller streams in Pegu, it frequently runs for considerable lengths in a perfectly straight line, along the foot of the bare strata of rock.

The Nga Ee Choung likewise rounds a ridge, the high Nga Ee Kyo, bearing in its northern extremity the name of Natsui Toung, (and running  $15^{\circ}$  W. of North,) but near its mouth the strata in the bed of the Thoungzay Choung no longer run h. 1 ( $15^{\circ}$  W. of North) but h. 11. ( $15^{\circ}$  E. of N.) with an inclination of  $75^{\circ}$  to the west.

There are a few Kyouktags (gates of rock) between the mouth of this Choung and the Thoungzay river, which becomes more tortuous here, but the real obstruction only begins at the mouth of the Kyouklyouk Choung, where the course assumes an entirely westerly direction, thus breaking through the strata in almost a right angle.

The rocks which obstruct the passage of timber are ten in number: they are marked in the sketch. None of them is larger than 200 tons measurement, but most are smaller.

In one place two planks are still squeezed in between the rocks; and the greatest danger exists in logs being driven in between the rocks so that they cannot be got loose. Yet considerable numbers of large logs have annually been brought through, both in the Burmese time and under the English rule. But the operation is difficult, and only practicable for a few days during the whole year.

The total number of first class trees in the Thoungzay Choung is as follows :

Trees above 7' in girth girdled in 1858, ..... 18,979

From 6' to 7' in girth about, ..... 9,489

Total, 28,468 trees.

About three-fourths of these stand above the Kyoukloongyi described, and much difficulty will be experienced in bringing them down, unless the rocks are blasted.

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu and Tenasserim.*

RANGOON,

*The 9th November, 1858.*

*Statement of Measurement of rocks to be removed in the Thoungzay Kyoukloongyi.*

No.	Length. <i>l</i>	Thickness. <i>d</i>	Height. <i>h</i>	Cubic contents in cubic feet $\frac{l \times d \times h}{2}$
1	33½"	17	15	8,521½"
2	11	16	15	2,640
3	20	14-7"	15	4,375
4	15	10	12	1,800
5	10	3	16	480
6	15	13	12	2,340
7	12	8-5"	8	808
8	8	6	3	144
9	17	9	7	1,071
10	12	7	8	672
				22,851½

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu, and Tenasserim.*

RANGOON,

*The 9th November, 1858.*

*Tabular statement shewing the Increase of Establishment proposed for the  
Office of the Superintendent of Forests in Pegu.*

No. 3191, Foreign Department.

*Dated 17th September, 1858.*

NATURE OF CHARGES.

PRESENT SCALE.				PROPOSED SCALE.			
<i>Rangoon Office Establishment.</i>				<i>Rangoon Office Establishment.</i>			
Head Clerk, ..	Rs. 200	0	0	Head Clerk, ..	Rs. 200	0	0
Second ditto, ..	.. 150	0	0	Second ditto, ..	.. 150	0	0
Third ditto, ..	.. 100	0	0	Third ditto, ..	.. 100	0	0
Copyist, ..	.. 40	0	0	Copyist, ..	.. 40	0	0
1 Burmese Writer, ..	.. 50	0	0	1 Burmese Writer, ..	.. 50	0	0
1 Ditto ditto, ..	.. 25	0	0	1 Ditto ditto, ..	.. 25	0	0
1 Ditto ditto, ..	.. 15	0	0	1 Ditto ditto, ..	.. 15	0	0
1 Surveyor, ..	.. 70	0	0	1 Surveyor, ..	.. 70	0	0
1 Peon for ditto, ..	.. 10	0	0	1 Peon for ditto, ..	.. 10	0	0
1 Karen Assistant, ..	.. 40	0	0	1 Karen Assistant, ..	.. 40	0	0
1 Gardener, ..	.. 18	0	0	1 Gardener, ..	.. 18	0	0
1 Assistant ditto, ..	.. 15	0	0	1 Assistant ditto, ..	.. 15	0	0
1 Duffery, ..	.. 14	0	0	1 Duffery, ..	.. 14	0	0
2 Orderly Peons, ..	.. 20	0	0	2 Orderly Peons, ..	.. 20	0	0
4 Office Peons, at 8 each, ..	.. 32	0	0	4 Office Peons, at 8 each, ..	.. 32	0	0
Total, ..	799	0	0	Total, ..	799	0	0
<i>Rangoon Timber Depôt.</i>				<i>Rangoon Timber Depôt.</i>			
1 Assistant, ..	.. 100	0	0	1 Assistant, ..	.. 100	0	0
1 Overseer, ..	.. 20	0	0	1 Overseer, ..	.. 20	0	0
1 Ditto, ..	.. 20	0	0	1 Ditto, ..	.. 20	0	0
1 Ditto, ..	.. 20	0	0	1 Ditto, ..	.. 20	0	0
2 Tindals, at 15 each, ..	.. 30	0	0	2 Tindals, at 15 each, ..	.. 30	0	0
5 Lascars, at 12 each, ..	.. 60	0	0	5 Lascars, at 12 each, ..	.. 60	0	0
16 Peons, at 10 each, ..	.. 160	0	0	16 Peons, at 10 each, ..	.. 160	0	0
2 Do. at Kemendine, at 10 ea., ..	.. 20	0	0	2 Do. at Kemendine, at 10 ea., ..	.. 20	0	0
2 Do. at Puzundoung, do., ..	.. 20	0	0	2 Do. at Puzundoung, do., ..	.. 20	0	0
Total, ..	450	0	0	Total, ..	450	0	0
<i>Prome Establishment.</i>				<i>Prome Establishment.</i>			
1 Assistant, ..	.. 300	0	0	1 Assistant, ..	.. 300	0	0
1 Clerk, ..	.. 80	0	0	1 Clerk, ..	.. 80	0	0
1 Burmese Writer, ..	.. 30	0	0	1 Burmese Writer, ..	.. 30	0	0
1 Orderly Peon, ..	.. 8	0	0	1 Orderly Peon, ..	.. 8	0	0
2 Office Peons, ..	.. 16	0	0	2 Office Peons, ..	.. 16	0	0
<i>Timber Depôt.</i>				<i>Timber Depôt.</i>			
1 Overseer, ..	.. 30	0	0	1 Overseer, ..	.. 30	0	0
6 Peons, at 8, ..	.. 48	0	0	6 Peons, at 8, ..	.. 48	0	0
1 River Peon, ..	.. 10	0	0	1 River Peon, ..	.. 10	0	0
Total, ..	522	0	0	Total, ..	522	0	0

*Tubular statement shewing the Increase of Establishment proposed for the  
Office of the Superintendent of Forests in Pegu—(Continued.)*

NATURE OF CHARGES.			
PRESENT SCALE.		PROPOSED SCALE.	
<i>Forest Establishment, Eastern Section.</i>		<i>Forest Establishment, Eastern Section.</i>	
1 Travelling Goung,	Rs. 30 0 0	1 Travelling Goung,	Rs. 30 0 0
9 Goungways, at 10 each,	.. 90 0 0	9 Goungways, at 10 each,	.. 90 0 0
Total,	.. 120 0 0	Total,	.. 120 0 0
<i>Forest Establishment, Western Section.</i>		<i>Forest Establishment, Western Section.</i>	
1 Travelling Goung,	.. 30 0 0	1 Travelling Goung,	.. 30 0 0
4 Goungways, at 10 each,	.. 40 0 0	4 Goungways, at 10 each,	.. 40 0 0
Total,	.. 70 0 0	Total,	.. 70 0 0
<i>Tharrawaddie, Southern Forest.</i>		<i>Tharrawaddie, Southern Forest.</i>	
1 Assistant,	.. 160 0 0	1 Assistant,	.. 160 0 0
1 Peon, ..	.. 8 0 0	1 Peon, ..	.. 8 0 0
2 Timber Peons, at 8 each,	.. 16 0 0	2 Timber Peons, at 8,	.. 16 0 0
Total,	.. 184 0 0	Total,	.. 184 0 0
<i>Forests.</i>		<i>Forests.</i>	
1 Goung, ..	.. 30 0 0	1 Goung, ..	.. 30 0 0
1 Goung, ..	.. 25 0 0	1 Goung, ..	.. 25 0 0
8 Goungways, at 10,	.. 80 0 0	8 Goungways, at 10,	.. 80 0 0
Total,	.. 135 0 0	Total,	.. 135 0 0
<i>Hline Forests.</i>		<i>Hline Forests.</i>	
1 Goung, ..	.. 25 0 0	1 Goung, ..	.. 25 0 0
4 Goungways, at 10,	.. 40 0 0	4 Goungways, at 10,	.. 40 0 0
Total,	.. 65 0 0	Total,	.. 65 0 0
<i>Pounggyee Forests.</i>		<i>Pounggyee Forests.</i>	
6 Goungways, at 10 each,	.. 60 0 0	6 Goungways, at 10 each,	.. 60 0 0
<i>Henzada and Bassein.</i>		<i>Henzada and Bassein.</i>	
1 Assistant,	.. 80 0 0	1 Assistant,	.. 80 0 0
1 Peon, ..	.. 8 0 0	1 Peon, ..	.. 8 0 0
2 Peons, at 8 each, ..	.. 16 0 0	2 Peons, at 8 each, ..	.. 16 0 0
<i>Forests.</i>		<i>Forests.</i>	
1 Goung, ..	.. 25 0 0	1 Goung, ..	.. 25 0 0
4 Goungways, at 10 each,	.. 40 0 0	4 Goungways, at 10 each,	.. 40 0 0
Total,	.. 169 0 0	Total,	.. 169 0 0
<i>River Stations.</i>		<i>River Stations.</i>	
1 Goungway, at Henzada,	.. 15 0 0	1 Goungway at Henzada,	.. 15 0 0
1 Ditto at Myanounng,	.. 10 0 0	1 Ditto at Myanounng,	.. 10 0 0
Total,	.. 25 0 0	Total,	.. 25 0 0

*Tabular statement showing the Increase of Establishment proposed for the  
Office of the Superintendent of Forests in Pegu—(Concluded.)*

NATURE OF CHARGES.					
PRESENT SCALE.			PROPOSED SCALE.		
<i>Toungoo Establishment.</i>			<i>Toungoo Establishment.</i>		
1 Assistant,	Rs.	350 0 0	1 Assistant,	Rs.	350 0 0
1 Clerk, ..	..	100 0 0	1 Clerk, ..	..	100 0 0
1 Burmese Writer, ..	..	40 0 0	1 Burmese Writer, ..	..	40 0 0
1 Orderly Peon, ..	..	10 0 0	1 Orderly Peon, ..	..	10 0 0
2 Office Peons, at 10 each, ..	..	20 0 0	2 Office Peons, at 10 each, ..	..	20 0 0
Total,	..	520 0 0	Total,	..	520 0 0
<i>Timber Department.</i>			<i>Timber Department.</i>		
1 Overseer, ..	..	40 0 0	1 Overseer, ..	..	40 0 0
3 Peons, at 10 each, ..	..	30 0 0	3 Peons, at 10 each, ..	..	30 0 0
1 Overseer, ..	..	60 0 0	1 Overseer, ..	..	60 0 0
4 Peons, at 10 each, ..	..	40 0 0	4 Peons, at 10 each, ..	..	40 0 0
Total,	..	170 0 0	Total,	..	170 0 0
<i>Forest Southern Section.</i>			<i>Forest Southern Section.</i>		
1 Goung, ..	..	40 0 0	1 Goung, ..	..	40 0 0
8 Goungways, at 10 each, ..	..	80 0 0	8 Goungways, at 10 each, ..	..	80 0 0
<i>Northern Section.</i>			<i>Northern Section.</i>		
1 Goung, ..	..	40 0 0	1 Goung, ..	..	40 0 0
5 Goungways, at 10 each, ..	..	50 0 0	5 Goungways, at 10 each, ..	..	50 0 0
Total,	..	210 0 0	Total,	..	210 0 0
<i>River Station.</i>			<i>River Station.</i>		
1 Goung, ..	..	25 0 0	1 Goung, ..	..	25 0 0
1 Peon, ..	..	10 0 0	1 Peon, ..	..	10 0 0
1 Goung, ..	..	30 0 0	1 Goung, ..	..	30 0 0
4 Peons, at 10 each, ..	..	40 0 0	4 Peons, at 10 each, ..	..	40 0 0
1 Ditto at Shwe Gyeen, ..	..	10 0 0	1 Ditto at Shwe Gyeen, ..	..	10 0 0
1 Ditto at Toungoo, ..	..	10 0 0	1 Ditto at Toungoo, ..	..	10 0 0
Total,	..	125 0 0	Total,	..	125 0 0
<i>Elephant Establishment.</i>			<i>Elephant Establishment.</i>		
Attendants for 5 Elephants, ..	120	0 0	Attendants for 5 Elephants, ..	120	0 0
Grand Total, ..	3,744	0 0	Total,	3,744	0 0
			<i>Burmese Sappers.</i>		
			20 Men, at 12 each,*	240	0 0
			1 Supervisor, ..	25	0 0
			Grand Total, ..	4,009	0 0

\* For one year experimentally.

\* Recommended on the grounds stated below. The necessity for the entertainment of the Establishment is apparent, sanction is therefore respectfully solicited thereto.

These men are required for the blasting of rocks which obstruct the passages for floating timber. The Major General commanding the Division having been applied for a party of sappers, refuses to comply, on the grounds that the Regulations of the Madras Army strictly prohibit small parties of sappers being detached from their companies.

H. NELSON DAVIES, Captain.

*Extra Asst. to the Commr. of Pegu and Agent to the Govr.-Genl.*



No. 227.

TO COLONEL A. P. PHAYRE, COMMISSIONER OF PEGU  
AND AGENT TO THE GOVR. GENERAL.

SIR,

I have the honor to report, that I have found it advisable as an experimental measure, to intro-

*Memo. of annexures.*

(A.) Extract from Report to Commr. T. and M. Provinces (paras. 25 to 30.)

(B.) Cir. Letter, No. 228 to Assistants Forest Department, (paras. 5 and 6) referred to.

(C.) Forest Report (paras. 118 to 120.)

(D.) Extract from letter to Assist. Commissioner Gonathoingyoung (paras. 1 to 3.)

(E.) Statement shewing former occupation and nationality of Forest contractors.

(F.) Statement shewing the transactions with several of the more successful Forest Contractors.

(G.) Notice, dated 3rd Nov. 1859.

(H.) Form of permit and Schedule of Fees.

duce already in a portion of the Pegu Forests, the change in the working of the same, alluded to, as likely to become necessary, in paras. 118, 119, 120, of my first Report, dated 16th December, 1856, on the Pegu Forests.

In the system hitherto adopted, the following operations connected with the working of the forests devolve upon the Forest Department, independently of the operations for the protection and improvement of the Forests.

I. The selection of the trees for killing, and girdling of the same.

II. The felling of the trees, bringing down the timber for

The trees to be girdled by officers of the Department only.

sale to Rangoon or other stations, and the disposing of it by sale.

2. The operation of selecting the trees to be killed, and the girdling of the same, must remain in the hands of the officers of the Forest Department, as long as the forests are managed with a view to their maintenance, and not to their destruction. It is impossible to prevent wanton and speedy destruction of the Teak in the Forests, if this operation is left to other parties.



Schedule of fees fixed for 1860 is attached. See Notice, dated 3rd November, 1859.

*d.* That the duration of these permits, is limited to one year only, and that the holder loses all right to any timber, which he may have brought away from the forests, but which may not have been paid for and marked at the place and within the time stipulated.

*e.* That the permit is revokable, at the will of the Superintendent or his Assistants, if it should be found that its provisions have not been carried out, or that any Forest rule has been violated. This, and the provision *d*, will, it is hoped, make it the interest of the Permit holder, to abide by the provisions of the Permit, and to prevent the violation of the Forest Rules by his people. For, however actively he may work, a portion of his timber will always remain behind in the forest, or on the way to the station where it is to be paid for, and he loses the amount expended on account of this timber if he fails to behave so as to render the renewal of his permit desirable. The importance of obtaining this renewal from year to year, will, it is hoped, induce the Foresters to enlist on the side of Forest conservancy, instead of co-operating in their destruction.

5. In settling the rates to be paid per log, the following points were

kept in view.

			southern forests by my predecessor to Messrs. E. Fowle and Co. varied from 4-8 to 8 per full-sized, and from 2 to 2-8 per undersized log. Calculated on the number of logs of each
	F. Sized.	U. Sized.	
Thoungzai, .....	8	2-8	
Onk knn, .....	6-8	2-8	
Mazalge, .....	4-8	2	
Magayce, .....	8	2-8	
Pounglin, .....	4-8	2	
Fegu, .....	6	2-8	

class, brought down from the different forests, the average amount realized is found to have been Rs. 6-10 per full-sized, and 2-6 per under-sized log. But the great rise in the price of the timber since 1856, warrants the adoption of higher rates now, moreover, those forests which have new girdled trees, contain better timber, which, as a rule, is nearer to the waterway.

*Second.* The rates fixed for the permits issued for the working of the forests on the Moulmain side, amount to

Rs. 5 per full sized	} in those forests that would, with regard to their distance from Moulmain,
„ 2-8. „ under-sized	

and the facilities for working them, correspond with the Pegu Forests. All this timber has to pay over and above the purchase money, a rate of Rs. 2-12 per full-sized log, as timber revenue at Kadoe, the rate per under-sized, which varies according to the cubical contents, amounting to about 1-8 on an average. This brings the Moulmain rates up to Rs. 7-12 per full-sized log.

„ 4 per under-sized log.

*Third.* The average amount hitherto realized by sale of the Government timber at Rangoon and other stations, has been Rs. 12-7; deducting the timber expenses, which are saved in the permit system, there will remain Rs. 6-13. If we assume, that the proportion of timber from the forests granted to permit holders will be

Under-sized (old seasoned and the upper part of large trees)

1 log, fetching Rs. 4 purchase money

Full-sized, 2 logs, fetching Rs. 16 purchase money

---

Total 3 logs fetching 20 Rs.,

the average rates likely to be realized are 6 Rs., 10 annas, 8 pie per log, which is below the amount realized hitherto by the contract system. But the proportion of undersized to full-sized logs, may not be 1 : 2 but 1 : 3 which would give an average of 7 Rs. per log.

The rates therefore, appear fully justified, and, in accordance with the principle laid down in para. 120 of my first forest report, they are rather low, but as they can be raised next year, it appeared preferable to fix them low, as it might otherwise be objected, that the new system has not had a fair trial.

6. A third class of timber crooks and small pieces has been

Small pieces why added. added, and these have been rated at 8

annas only, in order to encourage the bringing down of timber that would otherwise perish from the jungle fires, and which may be turned to advantage for Railway sleepers or other purposes. The rate fixed for similar pieces in the Moulmain forests is 4 annas, but as the Kadoe duty may be considered as amounting to 4 annas more, 8 annas appear justified for Pegu.

7. Now, as regards the ultimate profits of this system, as com-

Probable profits of the system of permits. pared with that of forest contracts, these will depend entirely on the greater or less number of logs brought down. For although the item

of timber expenses will be saved for the timber brought down by the permit holders, the miscellaneous expenditure, consisting of pay of establishment and general contingencies, is not likely to be immediately decreased by the introduction of the permit system. Should this hereafter be introduced for the whole of the country, the grounds and buildings of the Rangoon Timber Depot may be disposed of by sale, and the establishment maintained there dispensed with, which will effect a saving of Rs. 5,400 per annum. But the greater part of the establishment now employed for the management of Government timber, will be required for checking defraudations of revenue under the permit system.

The total of miscellaneous expenditure, amounts for the three years, from 1856-57 to 1858-59, to  
 Miscellaneous expenditure. Rs. 2,40,546-0-9, which gives, calculated upon the number of logs sold within that time (45,119) an average quota of Rs. 4-5 per log. This quota will become less, and the net revenue will increase, if the permit holders succeed in bringing down a larger number of logs than has hitherto been the case.

The revenue realized per log from the permit holders, is not likely to be larger than the profit of the working operations in the contract system, that is, the amount realized by sale, minus the timber expenses.

8. The advantages of this new arrangement over the present  
 General advantages of the system of permits. one are apparently great, but their importance must not be overrated.

*First.* The new arrangement obliges the foresters to obtain funds wherewith to work the forests from private parties, and this places them in a position of dependence on them. It thus gives private parties a hand in the working of the forests: they can make their arrangements about the size of the logs and the amount of the timber required.

By thus giving them a share in the working out of the timber resources of the country, it may be expected that the popular idea which views the Forest Department as an obstacle to the development of the resources of the country may, in some measure, be changed. But it will soon be discovered, that the advantage thus gained is only a small portion of what is actually wanted. It is not to have a share in the bringing down of the timber seasoned by the Forest Department, but it is the liberty to girdle such trees as are most convenient

to bring away, which is wanted by parties formerly engaged in the timber trade of Pegu; and it is this which cannot be granted without altogether destroying the possibility of conserving the Teak in the Forests.

*Second.* The doing away with the necessity of making advances to forest contractors, and of paying for the timber brought down by them long before any revenue on the same can be realized, is certainly a great advantage, and the decreased money-responsibility resulting therefrom will be felt a great boon by the officers of the Department.

But, on the other hand, it cannot be denied that the regularity of all money transactions with forest contractors which has been aimed at by the officers of the Forest Department, and the certainty with which the contractor can calculate his profits before hand, might be expected to facilitate the development of a class of steady and influential men of business attached to the Department, by strong ties of self-interest, on whom, under all circumstances, reliance could be placed.

The statements attached, shew what has been accomplished in this line. The original plan was, that the forest contractors would gradually become, so to say, a kind of aristocracy in the interior of the country,

Statement showing the transactions with such forest contractors as have been most successful in their working the forests.

and a counterpart of the foresters on the Moulmain side, many of whom, being in the hands of money dealers, and other parties of objectionable habits of business, are induced to conduct their concerns in a mode more approaching to gambling than to regular business.

But it probably is this very tendency towards gambling, which will render the new system more acceptable to Burmese and Karen Foresters. The trade in bamboos from the upper part of the Pegu river, by which Rangoon derives the greater portion of its supplies, is entirely based on the gambling propensities of the Burmese traders. The foresters sell the bamboos at certain rates, and the trader who brings down the rafts to Rangoon, rarely knows, beforehand, whether profit or loss will be the result of his transactions.

The system of forest contracts offers comparatively little scope for lawsuits about timber, and it will have to be seen, whether the permit system has the same advantage.

9. The reason why this change, so long contemplated, has now been introduced, is, because it appeared doubtful whether, under the system of forest contracts alone, it would be possible to procure a number of elephants proportionate to the very large quantity of timber ready to come down.

Reasons for introducing the change now.

Total estimate 1,28,047 logs, of which 87,377 seasoned in 1857, and a portion of which may be felled in 1860.

Three reasons have of late increased the difficulty of procuring elephants for forest work and of concluding forest contracts in Pegu.

*First.* The export of several hundred elephants from Rangoon to India. Nearly the whole of these were taken from those recently introduced into the Pegu Forests, where in 1826, with the exception of a few in Toungoo, not a single elephant was to be found in the hands of private parties.

*Secondly.* The high price of timber at Moulmein and the unexpectedly small supply this season, 45,000 instead of 70,000 logs; so that all Moulmein elephants are employed in the foreign territory.

*Thirdly.* The circumstance that during the last two years, the addition of the Tenasserim and Martaban Forests has rendered it impossible for the Superintendent to maintain that personal intercourse with the forest contractors throughout Pegu, which, in the first two years of the working of the forests on Government account had apparently proved successful. The system of Forest contracts, if it shall succeed, must be managed by officers who are thoroughly acquainted with the interior of the forests and the difficulties of working the same, and who can consequently fully enter into the wishes and interests of the foresters. The system of permits, devolving as it does upon other parties the care of bringing down the timber, does not require, in the same manner, the personal intercourse between Assistants and forest contractors.

10. Under these circumstances it appeared right to seize the opportunity to try a new system in a portion of the forests. The forests of the Sitang valley, have been selected, because they are sufficiently secluded from the remainder of the Pegu forests, to give no cause for confusion between private and Government timber, and the Prome forests have been added, because it might be urged, that there is not sufficient scope in the Sitang forests, there being only a small quantity

Forests where the permit system is at present to be introduced.

of old seasoned timber left in the same. At the same time, the opening of the Prome Forests in this manner, will afford an opportunity to obtain supplies for export from Bassein and consumption at that place, where of late, the demand for timber has risen considerably. Besides the forests here mentioned, the forests west of the Bassein Choung were opened to permit holders as an experiment in July last, on which subject I attach copy of a letter to the Assistant Commissioner, Gnathoingyoung. However, only one permit has been taken out, and no timber has been brought down on account of the same.

11. The statement on the margin shows the number of logs

Amount of timber opened to the thus opened to permit holders, and permit system. the number reserved for forest contractors.

tractors. The amount which may be expected from the latter, is large enough to render the continuation of the Rangoon Timber Depôt necessary; indeed, it is not likely that at present any considerable diminution will take place in the amount of timber to be			
<i>Permits will be granted in the</i>			
II. Division,	Prome Forest	No. of seasoned logs,	45,459
III. "	Western "	(partially) "	2,400
V. "	Sitang Forest,	west-side "	5,800
VI. "	" "	east-side "	5,800
Total No. of seasoned logs.			59,459
<i>Forest contracts will be made for the</i>			
I. Division	Tharawaddie Forest	No. of seasoned logs.	61,618
VI. "	West (partially)	" "	1,200
IV. "	Southern forest,	" "	5,770
Total of seasoned logs,			68,588

The amount which may be expected from the latter, is large enough to render the continuation of the Rangoon Timber Depot necessary; indeed, it is not likely that at present any considerable diminution will take place in the amount of timber to be sold at Rangoon by the Forest Department, although it will only be the produce of two and a half divisions instead of six.

It will also be observed, that the management of the permits will be entirely in the hands of the Assistants at Prome and Toungoo, and that the Deputy at Rangoon will have the management of forest contractors and the sale of timber. An experience of a few years, will, it is hoped, shew whether the one or the other system is preferable, and, as the right of the permit holders to the timber dragged by them is strictly confined to one year, the duration of their permit, it will be easy, without violation of any private interest hereafter, to return to the system of forest contracts, if such should appear desirable.

12. The adoption of the measure here discussed relieves the Forest Department, for the time being, from the responsibility of providing means for the working of the greater portion of the forests, and throws it upon those who are likely to have the greatest interest



in procuring timber. But should private parties fail, or not come forward in sufficient numbers, the forest contract system will have to be resumed, which, provided it is possible to secure the services of zealous assistants in charge of the different divisions of the forests, cannot but be successful in the end, although it may progress but slowly.

In conclusion, I would beg to observe, that the introduction of this system of working the forests is fully provided for in para. 3 of Schedule I. Forest rules, dated 1st October, 1859, authorizing the Superintendent to dispose of the seasoned Teak timber standing or lying in a certain forest tract, or of a portion of the said timber by sale to private parties.

The system of permits authorized by the forest rules.

The introduction of this change into the Sitang, Promé and Bassein forests is therefore fully within my powers, yet I should not have adopted a measure of such vital importance on my own responsibility, had I not repeatedly announced that the necessity for the same

See also Letter No. 717, dated 10th October, 1857.

would soon be felt, and had I not at different times personally discussed

the plan with you.

In matters like these, much depends on circumstances which it is impossible to foresee, and when you left for Ava I was not yet prepared to say whether it would be necessary to make the change in 1860, or whether it might be deferred till 1861.

13. Under these circumstances, I beg now to solicit your sanction to the introduction of this system of permits as an experimental measure, into a part of the Pegu Forests, and under the conditions detailed in this letter.

I have, &c.

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu, Tenasserim and Martaban Provinces.*

RANGOON,

*The 9th November, 1859.*

## ANNEXURE A.

PARAS. 25 TO 30 OF THE REPORT ON THE WORKING OF  
THE GOVERNMENT FORESTS IN THE TENASSERIM  
AND MARTABAN PROVINCES, DATED 27<sup>TH</sup> AUGUST,  
1859.

25. The plan now proposed to be pursued here is, to a certain degree, an imitation of the plan prevailing in the Zimmay Forests on the east side of the Salween river. These forests are under the Governor of Zimmay ; the inhabitants are Karens, but the Thetgouns or foresters are mostly Burmans or Talaings from Maulmain and other parts of the Tenasserim Provinces. The Karens are at present only employed by them as timber cutters and coolies.

Each forester here is the holder of a limited district, sometimes only one or two miles long (along the Salween) and extending 5 or 10 miles inland.

He obtains permission to work this forest by appearing with presents before the Zimmay Governor.

If these presents are large and presented at a suitable time, the grant of a rich forest, generally for one year only, is awarded. The foresters are at liberty to girdle, fell and drag such logs as they like. The dragging of the timber to the banks of the Salween river occupies the whole of the rains and the first part of the dry season ; so that in the month of March, most of the timber is collected on the banks of that river.

26. At that time parties from Maulmain, who also call themselves Thetgouns or foresters, come up ; they may be considered as the agents of Maulmain firms engaged in the timber trade, but in most instances their connection with those firms consists only in the circumstance of their having received advances for the purchase of timber. Frequently this is their second visit. The first is made during the rains : they then make advances to the foresters and stipulate the price at which the timber shall be sold to them.

In March, they pay the purchase money in full, and mark the logs with their stamps. As a rule no log is marked before it is actually made over to the purchaser on payment of the full amount.

27. About this time, and before the logs are launched into the Salween, the Siamese timber revenue collector makes his circuit along the bank of the river, going from one station where timber is collected to another and levying duty on the logs. In that part of the country the duty amounts to Rs. 4-8 per log. It is levied from the forester, and in some instances the value of the present is considered as in part payment, and a corresponding deduction is made. If the whole of the transaction has been satisfactory, the forester is generally permitted to continue to work in the same forest from year to year until its resources are exhausted. The outturn of one of the smaller forest districts, where one forester with two or three elephants is at work, generally amounts from 400 to 500 logs per annum.

Some natives of India have made a speculation of this mode of working the forests, and have by dint of extraordinary presents obtained the grant of very extensive forest districts, which they again sublet to others. But it is said that the Siamese authorities have found this mode less profitable in the end, and now prefer dealing with the foresters direct, as they thus secure a larger outturn of timber and accordingly realize a higher timber revenue.

28. The mode now described is the practice that, with some modifications, generally prevails in the whole of the forests beyond the British frontier, with the exception of those situated in the territory of the king of Burmah. In many cases, for instance, in the Karenee country and in many forests on the Shan side of the Thoungzee, the foresters are not foreigners but natives of the country, Karens, Siamese or Karenees. Again, in other instances, the foresters are wealthy enough to do away with the services of the timber purchasers from Maulmain, and they float down their timber themselves and dispose of it by sale at Maulmain, but the timber revenue is invariably levied in the manner described above, that is, after the logs have been dragged to the river's bank previous to their being launched.

The rates levied as timber duty are stated to vary as follows.

THOUNGZEEN FORESTS.

2, Zimmay territory (below Kamokle), .....	3	8	0
1, Yahine territory (above Kamokle,) .....	2	8	0

SALWEEN FORESTS.

3, Zimmay territory, .....	4	8	0
1, Karenee country, .....	4	0	0

29. In our forests, this system can only be adopted with several important modifications. We have not only the object in view to secure the highest possible amount of revenue for the moment, but it is at the same time our duty to protect the forests from injury, and thus to husband their resources, that they may not be exhausted by over working, but remain in the same condition, so as annually to yield the same or an increasing supply of timber.

In the forests enumerated above, the foresters have full liberty to girdle and to fell whatever tree they chooso; they need not take care to prevent the destruction of young Teak trees by their elephants.

30. We cannot accord to them the same liberty.

We must restrict them to the removal of the old seasoned timber left behind by former workers of the forest. We cannot allow them to girdle a single tree; and we must impose the penalty of ejection, upon their injuring young Teak in the forest.

We are obliged strictly to limit the duration of their permits to one year only. On these conditions, we cannot expect foresters to come forward, unless we offer them advantages of another nature.

The principal advantage is, the greater security under British rule; and this is a point which they have learnt thoroughly to appreciate.

Another advantage is, the greater proximity to Moulmain of our forests. But this is not sufficient to counterbalance the disadvantages of our system, and we must not expect to realize the same amount of revenue as we might by giving up the forests to their tender mercies.

(True Extract,)

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu, Tenasserim and Martaban Provinces.*

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## ANNEXURE B.

No. 228.

TO THE DEPUTY SUPERINTENDENT, RANGOON.

Sir,

With reference to the granting of forest contracts, or forest permits, I beg to make the following remarks.

2. With regard to the parties to whom contracts or permits may be given, you will abide by the practice hitherto observed, viz. to deal with such parties only, as go into the forests themselves and personally superintend the cutting and dragging and floating of the timber. Any deviation from this practice would render it exceedingly difficult effectually to protect the forests against depredations.

3. For supposing a permit or contract for a forest district were given to a mercantile firm, say at Rangoon, who appointed their own foresters to the different parts of the forest, these parties would receive their orders from their employers, and if found transgressing the forest rules, or not acting up to the terms of the permit, would naturally refer the Officers of the Forest Department to the managers of the firm, and the result would be unsatisfactory correspondence, or if the penalties of the permit were enforced, and parties transgressing them or the forest rules were ejected from the forest, their employers, at Rangoon, acquainted with what is going on in the forests only through the reports of their people, and thus unable to judge of the real merits of the case, would certainly have recourse to complaints, the settlement of which would be unsatisfactory, because in most cases it is exceedingly difficult to prove a transgression of the Forest rules or terms of permit anywhere but in the forests, on the spot where the transgression has been committed.

4. If the Superintendent and his assistants, when travelling through the forests find green trees felled or girdled, or trees seasoned by their orders felled before the time fixed, or if they find that the permit holders transgress each others' boundaries, it will generally be easy to put a stop to such proceedings by warning the forester, that if such a thing is found again he will have to quit the forest. But if we do not meet our own permit holders or forest contractors, but only coolie Goungs or other parties employed by permit holders living at Rangoon, they are not likely to heed our warnings, relying on their interests being protected by their employers.

5. In one case, the foresters will receive their permits from the Officers of the Forest Department, in the other from other parties. Those who are acquainted with the character of Burmans will easily imagine that the Officers of the Forest Department have practically no power over a forester who does not hold his permit direct from them. They would, as the Burman says, "not be our people," but the people of other parties, to whom they owe allegiance.

6. I am well aware, that both the forest rules and terms of permit provide the means for checking the destruction of the forests, but the time of the Officers of the Department is more necessarily required for the improvement and general management of the forests, and should as little as possible be taken up by the prosecution of transgressors. Hence it appears preferable that the Officers of the Department should have the means of preventing trespass, and this can only be effected by making the foresters directly responsible to these Officers.

This year, circumstances have rendered it necessary that all contracts and permits for the working of the Pegu Forests in 1860, should be concluded at Rangoon by the Superintendent (or in his absence, by his Deputy); but hereafter they will invariably be signed by the Officer in charge of the section, to which the forest belongs, although preliminary arrangements for certain contracts or permits may be made at Rangoon, or the Superintendent's sanction may have to be obtained previous to concluding the same.

7. The above remarks are not intended to imply that no contracts or permits for working the forests shall be given to other than Burman or Karen foresters. On the contrary, it is very desirable that Europeans or others of good character and abilities for the work, should embark in undertakings of this kind, provided they are willing to go into the forests themselves, and personally superintend the work.

Indeed, the rapid rise of the Moulmein timber trade from 1826 to 1840, may principally be ascribed to the circumstance that Europeans have settled for a time in the Attaran and Thoungyeon Forests and superintended the felling and bringing away of the timber themselves, although at the same time, these have been the parties who had the principal hand in the wanton destruction of the once splendid forests of the Attaran valley.

8. But in order as much as possible to avoid forest permits or contracts falling into the hands of more speculators, who might attempt to evade the rule by stating that it is their intention to settle in the forests, it will be necessary that you should submit to me, for final orders, such applications for permits from others than regular Thit-goungs as you may deem it fit to recommend. Should I be absent from Rangoon, and not within easy reach of the Officer recommending such application, you, as my Deputy, will pass orders in my stead.

9. I beg further to observe, that it is not intended this year to make any alterations in the terms of permit and in the rates to be paid for the timber. Should experience hereafter lead you to suggest any changes, I request the favour of your remarks early enough to be considered with reference to an amended form of permit or Forest contract.

I may at once mention one addition, which it may be necessary to make, viz. to impose the penalty of ejection from the forest upon parties transgressing each others' boundaries.

10. Each permit is to be made out in triplicate, and one copy to be sent to the Superintendent's Office.

11. The time when the timber is to be brought to the different places, is fixed as follows.

To Shoay Gyeen or Myetkyo from 1st August to 1st December.

Prome and Weppo from 15th July to 15th December.

The time has been fixed thus, to leave the remainder of the year free for the duties of the assistants in the Forests. In Prome the time has been fixed longer, because the Nansing timber frequently comes down early, and the Maloung and Boolay timber is not usually brought to Prome before November.

During the time fixed for Shoaygyeen, the Toungoo assistant will establish his office at that place, which will be his temporary residence for the time being.

This arrangement, apparently inconvenient, will on the contrary be found advantageous, as it will for a season bring the assistant nearer to that part of his district which is most remote from Toungoo. Moreover it will afford him an opportunity of marching through his forests on his return to Toungoo.

12. A list of fees to be levied for the different forest districts is attached hereto.

It is unnecessary to mention that the Forest Goungs will have to mark all timber that leaves their forest with their forest hammer, in the same manner as heretofore, and also send in the annual reports on such timber.

I have, &c.

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu and Tenasserim.*

RANGOON,

*The 9th November, 1859.*

## ANNEXURE C.

PARAGRAPHS 118, 119 AND 120, OF THE REPORT ON THE  
TEAK FORESTS OF PEGU, FOR THE YEAR 1856.

118. We have hitherto discussed the advantage of the system now in operation only, which, for the present state of things, is undoubtedly the most profitable system that could be selected, but it is to be hoped, that after a series of years, it will be practicable with regard to the working of the forests to confine the duties of the Forest Department to the three first operations, viz. *marking, girdling and felling*, and to leave the removal of the timber to the purchasers. This is the mode practised in most European Forests. For a continuance, this method will be found preferable, because it will free the Forest Department from the overwhelming amount of entirely heterogeneous work, which cannot but curtail the time and attention that ought to be given to the proper duties of forest administration, viz. to the measures which must be taken for the preservation, extension and consolidation of the forests.

119. It is, however, quite as evident, that for the present, such a change would not be advisable, since it would, as the amounts realized by the sale of the seasoned timber in the Southern forests show, reduce the revenue from the forests by more than one-half. Government must therefore, as it were, be the pioneers of an improved working system and introduce into the country, as well as raise in it, a class of able foresters with the means of working the forests properly. When these improvements shall, to a certain degree, have been accomplished; when the relative difficulties and treasures of the different forest districts shall have become better known; and lastly, when the reputation of Rangoon timber shall have been re-established, then may we expect that enterprising merchants will come forward, and availing themselves of the experience collected and the assistance prepared by Government, offer such prices for the seasoned timber in the forests, as will secure the same or even a higher revenue than the present system. Thus, the taking of the forest work out of the hands of the mercantile community has been no arbitrary measure. They have only to offer prices higher than those the Forest Department by



its own working can realize, and the removal of the timber previously seasoned by the Department may, without danger, be thrown open to their enterprize.

120. It would be useless now to enter into full particulars concerning the execution of those plans : that must be reserved for a distant future ; but, as in the course of time, this subject might easily be lost sight of, it may not be useless to state a few of the leading points that will have to be observed.

I. To sell to the highest bidder the permission to bring away the seasoned timber of a certain forest district ; the purchase money to be paid before the working of the forest commences.

II. This permission to be strictly limited to the trees that have been seasoned by the Forest Department.

III. The permission to be available for two years only.

IV. A uniform rate per log, large or small, to be paid over and above the purchase money, when the timber is brought down to the place of sale, and this rate to be for all forests the same, irrespectively of the district from which the timber is brought down.

True Extract,

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu, Tenasserim and Martaban Provinces.*

## ANNEXURE D.

EXTRACT PARAS. 1, 2, 3 OF LETTER No. 51, DATED 10<sup>TH</sup> AUGUST, 1859, TO ASSISTANT COMMISSIONER, GNATHOINGYOUNG.

1. With reference to para. 1, of Major Fytche's letter, No. 121, dated 29th July, 1859, I have the honor to transmit copies and translation of a contract entered into with one Maung Tsan Doon of Bassein, for the purpose of working the Kyonk Choungalay Forests during the remainder of 1859.

2. I will ask you to do me the favour to collect the purchase money of Rs. 5 per log, due on his timber when it reaches Gnathoingyoung, and to pay the amount into the Bassein treasury as "remit-

tances of the Pegu Forest Department," the receipts being sent to this office.

You will observe that the forester will become the owner of all those logs for which he has made payment on their passing Gnathoing-young before the 1st January, 1860, but that he forfeits all claim to logs that may be left above that place, or for which the amount stipulated may not have been paid. Such logs will be brought down by the holder of the permission for 1860, but if the present holder gives no cause of complaint, it will be advantageous to give him a new permit for next year.

3. You are aware that this mode of proceeding is different from that pursued in the other forests of Pegu, where a certain amount is paid per log for the bringing down of the same to the place of delivery, the timber being afterwards sold on account of Government.

The present arrangement has been adopted is a temporary measure, because from all information hitherto received regarding the Bassein forests, their extent would not warrant the establishment of a Government timber dépôt at Bassein. I shall consider it a favour, if you will, in the commencement of my operations in the Bassein district, grant your assistance in the manner described above.

(True Extract,)

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu, Tenasserim and Martaban Provinces.*

# ANNEXURE E.

Statement shewing former Occupation and Nationality of Forest Contractors.

	1856.			1857.			1858.			1859.		
	Burmese and Talains.	Karens.	Total.	Burmese and Talains.	Karens.	Total.	Burmese and Talains.	Karens.	Total.	Burmese and Talains.	Karens.	Total.
Inhabitants of the Division.	3	0	0	2	0	0	2	0	0	0	0	0
Myookes and Tyke Thoo Gyees (or their sons or relatives) .....	11	0	0	2	0	0	0	0	0	0	0	0
Subordinates of the Forest, .....	0	1	15	14	3	21	18	3	23	11	2	15
Department cultivators and men of no particular trade, .....	0	5	0	4	4	0	4	3	0	6	2	0
Foresters from Moulmein and other places, .....	4	0	9	9	0	18	5	0	0	4	0	12
Timber Merchants from Rangoon, Prome, Toungoo, &c. ....				1*			1†	0	14			
Foreigners.												
Total, .....	18	6	24	32	7	39	31	6	37	21	6	27

\* Armenian. † Chittagonian. ‡ Armenian.

(Sd.) D. BRANDIS,  
Supdt. of Forests in Pegu, Tenasserim and Martaban Provinces.

RANGOON,  
The 9th November, 1859. }

**ANNEXURE F.**  
*Statement showing the transactions with several of the more successful Forest Contractors.*

No.	NAMES OF CONTRACTORS.	NAME OF FORESTS.	No. of years working from 1856 to 1859.	Total No. of logs brought down including the transactions of 1856-57-58, yet been concluded.	Total amount of advances made to Forest Contractors.	Total amount paid to Contractors on account of Timbers.	REMARKS.
1	Moung In Gyke.	Thara-Beeling, .....	3	2,356	5,000 0 0	16,547 8 0	Karen from Moulmein.
2	Moung Ta and Moung Tali.	Momboo and Tounmyo, ...	3	1,919	5,390 0 0	16,617 8 0	Talain Thitgoung from ditto.
3	Moung Bynh and Moung Jikkai.	Pegu West, ...	3	763	1,500 0 0	5,597 0 0	Karen cultivators from Pegu.
4	Moung Buroh.	Southern Ponglin, ...	4	1,741	2,370 0 0	7,001 12 0	Ditto ditto Ponglin.
5	Moung Toombyo.	Oakkan, ...	3	899	900 0 0	5,016 2 0	Ditto ditto Oakkan. [Toungoo.
6	Moung Panhyo.	Kannee after-ward Myohla Koonoung.	3	814	4,600 0 0	10,806 4 0	Burman Timber Merchant from
7	La Quay.	Bimbyah and Guaythai af-	3	1,931	0 0 0	17,188 4 0	Karen Tyke Thoogyee from [Koonoung.
8	Shoay Yaik and Meik Pau.	terward Swoh and Kannee.	4	3,320	9,550 0 0	24,299 12 0	[mein. Karen Thitgoungs from Moul-
		Total, ..		13,743	29,310 0 0	1,03,077 2 0	

RANGOON,  
 The 9th November, 1859. }

(Sd.) D. BRANDIS,  
 Supdt. of Forests in Pegu, Tenasserim and Martaban Provinces.

## ANNEXURE G.

## NOTICE.

Permission to bring down the seasoned timber from the Prome and Sitang Forests for 1860, will be given as an experimental measure on the following terms :—

Permits will be given to such parties only as go into the forests themselves, and personally superintend the working.

No advances will be made by the Forest Department, and a fee will be charged for each Permit issued, varying according to the extent and nature of the forests.

No trees are to be girdled by the holder of the Permit, and no timber girdled after 1857 is to be felled or removed.

All timber from the Prome Forests must be brought to Prome, (except that from the Showaylay and Shaboung Forests, which must be brought to Weppoh village near Pormday) and fully paid for before it can be in any way disposed of by the parties who have brought it down. Timber from the Sitang Forests must be brought to Showay-ghen (except that from Bonee and Doonzarit, which must be brought to Myitkyo) and be fully paid for in like manner.

The following are the rates which are to be paid.

*For every log in middle girth above 4 feet*

6 inches, ..... Rs. 8 0 0

ditto ditto below 4 ft. 6 inches Rs. 4 0 0

*For crooks and small pieces either in mid-*

*dle girth below 3 feet, or in length*

below 12, ..... Rs. 0 8 0 each.

Further particulars can be obtained at the Forest Office.

The following are the names of the forests, and the estimated number of seasoned trees in each.

## PROME FORESTS, EAST.

<i>Names of Forests.</i>	<i>Estimated No. of seasoned trees.</i>	<i>Scale of fees. Rs.</i>
Shaboung, .....	6,800	250
Shwaylay, South side, .....	14,655	500
ditto, North side, .....	2,908	100

South Nawing, .....	8,486	650
Middle ditto, .....	4,720	350
Choung Touk, .....	2,385	150
Tsoon Choung, .....	1,166	90
North Nawing, .....	2,311	100
Pudday, .....	480	30
Choung Gounggyei, .....	1,000	75

PROME FORESTS, WEST.

Kama, .....	800	60
Matoung, South, .....	800	60
ditto, North, .....	800	60

SITANG FORESTS, WEST.

Bonce, .....	500	50
Roow, .....	500	50
Banloung, .....	300	25
Phyoo, .....	500	50
Kaboung, .....	1,000	100
Tswah, .....	2,000	150
Myolla, .....	1,000	50

SITANG FORESTS, EAST.

Doon Sarit, .....	200	25
Shwaygheen, .....	200	25
Padah, .....	300	216*
Moong, .....	300	236†
Youkthawa, .....	500	50
Thoukyagat, .....	1,000	100
Kannee, .....	700	50
Koonoung, .....	1,100	50
Bymbyay and Gwaythay, .....	1,500	100

(Signed) D. BRANDIS,

*Supdt. of Forests in Pegu, Tenasserim and Martaban Provinces.*

RANGOON,

*The 3rd November, 1859.*

\* The fee is large because there are 142 logs already cut for bringing away.

† The fee is large because there are 141 logs already cut for bringing away.

ပိုင်းနှင်း၊ တနင်းသာရီ၊ ဣတ္ထမသိုင်းသစ်တောခုံးတော်က။

စ်တောတွင်၁၈

ရက်နေ့ကစ၍။

ရက်နေ့သိုင်းရောက်အောင်၊ သစ်များကို။ ခုတ်လုပ်စေခြင်းငှါ။ ပေး

၎င်းသစ်တော၏နယ်ပါယ်အပိုင်းအချား။

ည်။ လုပ်ကိုင်ပိုင်သောအခွင့်လက်မှတ်စာအတွက်။

ပေးပြီး

အခွင့်လက်မှတ် ပေးသည်အချက်။

။ သစ်ခေါင်း

ကို။

ကင်းများ။ ကို ခုတ်လုပ်ဆွယံပိုင်စေသည်။ သို့သော်လည်း။ ၁၈၅ ခုနှစ်နှင့်။

းသည်သစ်များကို။ မချမယူရ။

စွာသည်။

အတွက်တသာရသည်ဖြစ်၍။ ၁၈

ည်စေသည်။ သို့သော်လည်း။ ၎င်းအခွင့်လက်မှတ်စာအပိုင်း ဖြစ်စေ။ သစ်

ကည်ကြည်အောင်မလုပ်မကိုင်လျှင်။ သစ်တောဝန်ကြီးမင်းဖြစ်စေ။

င်းဖြစ်စေ။ ၎င်းအခွင့်လက်မှတ်စာကို။ မည်သည်နေ့ရက်မဆို။ ပြန်၍နှုတ်သိမ်း

စာအတွက်။ သစ်တောခုံးတော်သို့။ ပေးပြီးငွေကိုလည်း။ ပြန်၍ပေးတော်မမူ။

စ်များကို။ ဖောင်ဖွဲ့၍။ သို့မျှယူခဲ့ရသည်။ ၎င်းသစ်များကို။

ပွားရန်။ အခွင့်မရခင်။ အောက်တွင်ပါရှိသည်ဈေးနှုန်းအပိုင်း။ အကောတ်

No. 248 J. L. B.

TO COLONEL A. P. PHAYRE, COMMISSIONER OF PEGU  
AND AGENT TO THE GOVERNOR-GENERAL, RANGOON.

SIR,

I have the honor to bring to your notice, that my Deputy has informed me that one of the principal objections raised against the system of forest permits is, the provision that only regular Thitgoungs are to receive permits.

My object in introducing this system as an experimental measure, and in a portion of the Pegu Forests, was to facilitate the working of the forests by introducing the agency of private capital and European enterprise. This, however, I am informed, the provision to grant forest permits to Thitgoungs only is likely altogether to frustrate.

2. It is urged that unless the business of the foresters can be conducted in the name of the merchant who lends his capital to this enterprise, there will be no security to the latter, and that few if any will embark in such uncertain speculations, which will give them entirely into the hands of natives who are far beyond their reach in the forests.

3. I refrain from discussing the correctness of this proposition. The greater portion of the Maulmain timber supplies is derived from the foreign territories, and in a manner similar to that proposed in the permit system. The foresters obtain their permission to work the Shan or Karenee Forests from the chiefs of these countries direct, and work the timber on their own name and account. In many instances, they are the immediate subjects of their chiefs themselves, Shans or Karenees.

But the funds wherewith to work and the final payment for the timber delivered, they receive from the agents of the great firms engaged in the timber trade of Maulmain, who regularly go up twice a year, once to make advances and once to receive the timber. It was my aim to introduce this mode of transaction into those of the Pegu Forests which have been thrown open to forest permits. But



I will not deny, that this mode must grow gradually, and cannot be expected to spring up in a day.

4. The opposition of those, who object to the present system of Forest Permits in Pegu, though it may not be correct if examined from a general point of view, appears fully justified in the commencement of a new system of operations which, combined with the great difficulty experienced at present in obtaining the means of working, principally elephants, must necessarily appear to offer obstacles of an unusual magnitude.

5. On the other hand, we must not shut our eyes to the prospect of a series of objections, of which the present one is only the first.

It requires little consideration to foresee that if permits are granted to others than Thitgoungs, the next step will be to stigmatize the limitation of the permits to one year as a measure of unjust severity. The power of immediately ejecting trespassing parties will next, practically at least, be abolished, and it will require a firmness which it may not always be possible to exercise against the representatives of "private enterprize," not at last to give up the main protection of our forests, the right of selecting and girdling the trees that may be felled and removed.

6. Giving the permits into the hands of parties who do not themselves go into the forests, but who are in a position to exercise a paramount influence on the general management of matters, is a step, the importance of which can scarcely be overrated.

There were excellent provisions for protecting the Attaran Forests in the rules established, when the permits for working them were first given: not one of them was respected by the permit holders, and, with the exception of native foresters, in no case can the penalties for breach of the same be enforced.

And indeed in a question like this, the position of the local authorities is so difficult that it is scarcely right to expect a different result: on the one hand, the certainty of impeding the progress of the settlement by restrictive measures and the impatience for immediate results;—on the other, the dim prospect of a more slow but steady development, which cannot be expected to afford satisfaction in this country, when the interest of every European connected with it is likely to cease with his own limited career in public or private concerns.

8. Such are the prospects of what might be called the liberal course in the management of the Pegu Forests, and it is very much to be regretted, that the failure of the contract system in districts not under the immediate control of Rangoon, should have placed before us an alternative of so dangerous a nature.

Yet it is right to consider, whether under the circumstances given, it is not preferable to incur the risk of opening, as a temporary measure, the Forests permits to others than Thitgouns, than to appear to obstruct the development of the resources of this country by rendering it difficult for private enterprize to embark in the working of the forests.

The introduction of permits has been designated as an experimental measure of a temporary nature, only we reserve to ourselves the right of returning to the contract system if the other should not appear sufficiently successful, but this intention places upon us the obligation of granting, as far as possible, full scope to the holders of forest permits.

10. Having thus set before you, here and in my former letters  
 No. 227 of 9th November, 1859. on the subject, the state of the case,  
 No. 228 (Circular). I beg to solicit your instruction, whether I may consider myself authorized, as an experimental measure, and for the term of one year only, to grant forest permits to others than Thetgouns who themselves go into the forests and conduct the working of the timber.

I would at the same time solicit the favour of your communicating your instructions on this subject to my Deputy during my absence from Rangoon, with whom I have arranged regarding the measures he will have to take.

I have, &c., &c.

(Signed) D. BRANDIS,

*Supdt. of Forests Pegu, Tenasserim and Martaban Provinces.*

AKYAB,

*The 4th December, 1859.*